

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 754AA  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820  
 Governor no. : 0 421 813 561

Customer-spec. information

Customer : KHD  
 Engine : BF12L513C

1st version kW : 367.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A01

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm<sup>3</sup>/ : 14.7...14.9  
 100 s : (14.4...15.1)

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 380  
 travel mm : 2.30...2.60  
 3rd speed rpm : 800  
 travel mm : 5.20...5.50  
 4th speed rpm : 1200  
 travel mm : 8.50...8.70  
 5th speed rpm : 1280  
 travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 860  
 Del.quantity : 147.0...149.0  
 1000 : (144.5...151.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 11.00  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1260...1290  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 650  
Rack travel in m: 12.00...12.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 450  
Pressure hPa : 860  
Rack travel mm : 12.00...12.10

Measurement  
Speed 1/min : 450

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 370  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 250  
Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 754AB  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820  
 Governor no. : 0 421 813 561

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 348.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A03

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.50...11.60

Del. quantity cm<sup>3</sup>/ : 13.7...13.9

100 s: (13.4...14.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40

2nd speed rpm : 380  
 travel mm : 2.30...2.60

3rd speed rpm : 800  
 travel mm : 5.20...5.50

4th speed rpm : 1200  
 travel mm : 8.50...8.70

5th speed rpm : 1280  
 travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 800

Del. quantity : 137.0...139.0

1000 : (134.5...141.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.50  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1260...1290  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 650  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 450  
Pressure hPa : 800  
Rack travel mm : 11.50...11.60

Measurement  
Speed 1/min : 450

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 235  
Rack travel in m: 10.80...11.00

START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 754AC  
 Injection pump  
 Pump designation : PE12P110A92DLS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820  
 Governor no. : 0 421 813 561

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 333.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A05

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 11.20...11.30  
 Del. quantity cm<sup>3</sup>/ : 13.3...13.5  
 100 s : (13.0...13.7)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 380  
 travel mm : 2.30...2.60  
 3rd speed rpm : 800  
 travel mm : 5.20...5.50  
 4th speed rpm : 1200  
 travel mm : 8.50...8.70  
 5th speed rpm : 1280  
 travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 700  
 Del. quantity : 133.0...135.0  
 1000 : (130.5...137.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.20  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1250...1280  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 650  
Rack travel in m: 11.20...11.40

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 450  
Pressure hPa : 700  
Rack travel mm : 11.20...11.30

Measurement  
Speed 1/min : 450

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 250  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 215  
Rack travel in m: 10.70...10.90

#### START CUT-OUT

AD6

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 401 840 754AD

Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820  
 Governor no. : 0 421 813 561

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kw : 330.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A07

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 13.1...13.3

100 s : (12.8...13.5)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40

2nd speed rpm : 380  
 travel mm : 2.30...2.60

3rd speed rpm : 800  
 travel mm : 5.20...5.50

4th speed rpm : 1200  
 travel mm : 8.50...8.70

5th speed rpm : 1280  
 travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 700

Del.quantity : 131.0...133.0

1000 : (128.5...135.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1250...1280  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 650  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 450  
Pressure hPa : 690  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 450

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 250  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 215  
Rack travel in m: 10.70...10.90

START CUT-OUT

A08

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 754AE  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820  
 Governor no. : 0 421 813 561

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kw : 320.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.70...10.80

Del.quantity cm<sup>3</sup>/ : 12.6...12.8

100 s : (12.3...13.0)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40

2nd speed rpm : 380  
 travel mm : 2.30...2.60

3rd speed rpm : 800  
 travel mm : 5.20...5.50

4th speed rpm : 1200  
 travel mm : 8.50...8.70

5th speed rpm : 1280  
 travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del.quantity : 126.0...128.0  
 1000 : (123.5...130.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 9.70  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 650  
Rack travel in m: 10.70...10.90

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

:

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 754AF  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820  
 Governor no. : 0 421 813 561

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 300.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 10.30...10.40  
 Del.quantity cm<sup>3</sup>/ : 11.6...11.8  
 100 s: (11.3...12.0)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 380  
 travel mm : 2.30...2.60  
 3rd speed rpm : 800  
 travel mm : 5.20...5.50  
 4th speed rpm : 1200  
 travel mm : 8.50...8.70  
 5th speed rpm : 1280  
 travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del.quantity : 116.0...118.0  
 1000 : (113.5...120.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 9.30  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1140...1170  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 650  
Rack travel in m: 10.30...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

:

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 754AG  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PAS20  
 Governor no. : 0 421 813 561

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kw : 324.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 11.00...11.10  
 Del. quantity cm<sup>3</sup>/ : 12.9...13.1  
 100 s : (12.6...13.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 380  
 travel mm : 2.30...2.60  
 3rd speed rpm : 800  
 travel mm : 5.20...5.50  
 4th speed rpm : 1200  
 travel mm : 8.50...8.70  
 5th speed rpm : 1280  
 travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del. quantity : 129.0...131.0  
 1000 : (126.5...133.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1250...1280  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 650  
Rack travel in m: 11.00...11.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:  
:

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 755AA  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV750PA623  
 Governor no. : 0 421 813 573

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 276.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A15

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.00...12.10  
 Del. quantity cm<sup>3</sup>/ : 14.7...14.9  
 100 s : (14.4...15.1)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s : (1.2...2.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 147.0...149.0  
 1000 : (144.5...151.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 86...94

Testing:  
 1st rack travel in: 11.00  
 Speed rpm : 748...753  
 2nd rack travel in: 5.50  
 Speed rpm : 780...787  
 4th rack travel in: 820  
 Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 748...753

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 140.0...160.0

1000 s: (136.0...164.0)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

#### APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 755AB  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 768  
 Governor  
 Governor design. : RQV750PA823  
 Governor no. : 0 421 813 573

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 255.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A17

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 12.5...12.7

100 s : (12.2...12.9)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s : (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 125.0...127.0  
 1000 : (122.5...129.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 86...94

Testing:  
 1st rack travel in: 10.00  
 Speed rpm : 750...755  
 2nd rack travel in: 5.50  
 Speed rpm : 775...782  
 4th rack travel in: 820  
 Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 750...755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

#### APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 755AC  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RGV750PA823  
 Governor no. : 0 421 813 573

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 232.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 12.5...12.7

100 s : (12.2...12.9)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.5...2.1

100 s : (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 125.0...127.0

1000 : (122.5...129.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Testing:

1st rack travel in: 10.00

Speed rpm : 750...755

2nd rack travel in: 5.50

Speed rpm : 775...782

4th rack travel in: 8.20

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 755AD  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV75DPA823  
 Governor no. : 0 421 813 573

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kw : 228.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A21

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 10.30...10.40  
 Del. quantity cm<sup>3</sup>/ : 10.9...11.1  
 100 s : (10.6...11.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s : (1.2...2.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 109.0...111.0  
 1000 : (106.5...113.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Testing:  
 1st rack travel in: 9.30  
 Speed rpm : 750...755  
 2nd rack travel in: 5.50  
 Speed rpm : 773...780  
 4th rack travel in: 820  
 Speed rpm : 0.00...1.00

BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 9.30

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 755AE  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV750PA823  
 Governor no. : 0 421 813 573

Customer-spec. information  
 Customer : KHD

Engine : 8F12L513

1st version kW : 206.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A23

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.30...10.40

Del.quantity cm<sup>3</sup>/ : 10.9...11.1

100 s : (10.6...11.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.5...2.1

100 s : (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 109.0...111.0

1000 : (106.5...113.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Testing:

1st rack travel in: 9.30

Speed rpm : 750...755

2nd rack travel in: 5.50

Speed rpm : 773...780

4th rack travel in: 820

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AA  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 463

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 342.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A25

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 14.9...15.1

100 s: (14.6...15.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...7.0

Del. quantity cm<sup>3</sup>/ : 1.5...2.1

100 s: (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del. quantity : 149.0...151.0

1000 : (146.5...153.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.00

Speed rpm : 1035...1050

2nd rack travel in: 5.50

Speed rpm : 1070...1100

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 11.00  
Speed rpm : 1035...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:  
:

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AB  
 Injection pump  
 Pump designation : PE12P110A92DLS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 463

Customer-spec. information  
 Customer : KHC

Engine : BF12L513C

1st version kW : 311.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

A27

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s : (14.6...15.3)

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.8...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s : (1.2...2.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Del. quantity : 149.0...151.0  
 1000 : (146.5...153.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 11.00  
 Speed rpm : 1035...1050  
 2nd rack travel in: 5.50  
 Speed rpm : 1070...1100

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

TORQUE CONTROL  
2nd speed rpm : 650

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1035...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del. quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

:

#### APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AC  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 463

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 272.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 11.10...11.20  
 Del. quantity cm<sup>3</sup>/ : 12.6...12.8  
 100 s : (12.3...13.0)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.8...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s : (1.2...2.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Del. quantity : 126.0...128.0  
 1000 : (123.5...130.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 10.10  
 Speed rpm : 1035...1050  
 2nd rack travel in: 5.50  
 Speed rpm : 1060...1090

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

#### BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 10.10  
Speed rpm : 1035...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:  
:

#### APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AD  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 463

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 263.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

B03

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 14.9...15.1

100 s : (14.6...15.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...7.0

Del. quantity cm<sup>3</sup>/ : 1.5...2.1

100 s : (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del. quantity : 149.0...151.0

1000 : (146.5...153.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.00

Speed rpm : 1035...1050

2nd rack travel in: 5.50

Speed rpm : 1070...1100

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1035...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm3/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:  
:

APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AE  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 463

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 232.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

B05

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 12.5...12.7

100 s : (12.2...12.9)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...7.0

Del.quantity cm<sup>3</sup>/ : 1.5...2.1

100 s : (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 125.0...127.0

1000 : (122.5...129.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.00

Speed rpm : 1040...1050

2nd rack travel in: 5.50

Speed rpm : 1065...1095

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

TORQUE CONTROL  
Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 650  
Rack travel in m: 11.30...11.50

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm3/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:

#### APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AF  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 465

Customer-spec. information  
 Customer : KHD

Engine : BF12L513  
 1st version kw : 220.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

B07

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 10.60...10.70

Del.quantity cm<sup>3</sup>/ : 11.6...11.8

100 s: (11.3...12.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...7.0

Del.quantity cm<sup>3</sup>/ : 1.5...2.1

100 s: (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 116.0...118.0

1000 : (113.5...120.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.60

Speed rpm : 1040...1050

2nd rack travel in: 5.50

Speed rpm : 1060...1090

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 10.60...10.70  
2nd speed rpm : 650  
Rack travel in m: 10.90...11.10

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.60  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

:

#### APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AG  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 463

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 215.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 11.4...11.6

100 s : (11.1...11.8)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...7.0

Del. quantity cm<sup>3</sup>/ : 1.5...2.1

100 s : (1.2...2.3)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del. quantity : 114.0...116.0

1000 : (111.5...118.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.50

Speed rpm : 1040...1050

2nd rack travel in: 5.50

Speed rpm : 1060...1090

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

TORQUE CONTROL  
Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 650  
Rack travel in m: 10.80...11.00

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.50  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:  
:

#### APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 763AH  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1000PA803-1  
 Governor no. : 0 421 801 463

Customer-spec. information  
 Customer : KHD

Engine : BF12L513  
 1st version kW : 206.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750  
 Rack travel in mm : 10.30...10.40  
 Del.quantity cm<sup>3</sup>/ : 10.9...11.1  
 100 s : (10.6...11.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.8...7.0  
 Del.quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s : (1.2...2.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Del.quantity : 109.0...111.0  
 1000 : (106.5...113.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 9.30  
 Speed rpm : 1040...1050  
 2nd rack travel in: 5.50  
 Speed rpm : 1055...1085

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 340...380

TORQUE CONTROL  
Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 650  
Rack travel in m: 10.60...10.80

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del. quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.5...23.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

:

#### APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AA  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 334.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.30...11.40

Del. quantity cm<sup>3</sup>/ : 13.0...13.2

100 s : (12.7...13.4)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 750  
 travel mm : 4.90...5.30

4th speed rpm : 1200  
 travel mm : 8.40...8.60

5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 980

Del. quantity : 130.0...132.0

1000 : (127.5...134.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 10.30  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1260...1290  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 85...93

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 300...510

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 650  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 450  
Pressure hPa : 980  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 450

1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 480  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 425  
Rack travel in m: 10.60...10.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del. quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AB  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 323.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 12.5...12.7

100 s : (12.2...12.9)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 750  
 travel mm : 4.90...5.30

4th speed rpm : 1200  
 travel mm : 8.40...8.60

5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 950

Del.quantity : 125.0...127.0

1000 : (122.5...129.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1260...1290  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 85...93

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 300...510

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 650  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 450  
Pressure hPa : 950  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 450

1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 455  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 410  
Rack travel in m: 10.50...10.70

START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s : (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s : (136.0...164.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AC  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 316.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

B17

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.90...11.00

Del. quantity cm<sup>3</sup>/ : 12.2...12.4

100 s : (11.9...12.6)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 750  
 travel mm : 4.90...5.30

4th speed rpm : 1200  
 travel mm : 8.40...8.60

5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 900

Del. quantity : 122.0...124.0

1000 : (119.5...126.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1260...1290  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 85...93

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 300...510

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 650  
Rack travel in m: 10.90...11.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 450  
Pressure hPa : 900  
Rack travel mm : 10.90...11.00

Measurement  
Speed 1/min : 450

1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 440  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 410  
Rack travel in m: 10.50...10.70

START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del. quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.90  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AD  
 Injection pump  
 Pump designation : PE12P110A92OLS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 302.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 11.7...11.9

100 s : (11.4...12.1)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 750  
 travel mm : 4.90...5.30  
 4th speed rpm : 1200  
 travel mm : 8.40...8.60  
 5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del. quantity : 117.0...119.0  
 1000 : (114.5...121.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

#### Testing:

1st rack travel in: 9.50  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1255...1285  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 300...510

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 650  
Rack travel in m: 10.50...10.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup> / : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

On activation of the starting solenoid,  
the start position must be reached.



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AE  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kw : 290.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 11.0...11.2

100 s : (10.7...11.4)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 750  
 travel mm : 4.90...5.30

4th speed rpm : 1200  
 travel mm : 8.40...8.60

5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 110.0...112.0

1000 : (107.5...114.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 9.20  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1250...1280  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 85...93

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 300...510

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 650  
Rack travel in m: 10.20...10.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AF  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 278.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.80...9.90

Del.quantity cm<sup>3</sup>/ : 10.4...10.6

100 s: (10.1...10.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 750  
 travel mm : 4.90...5.30

4th speed rpm : 1200  
 travel mm : 8.40...8.60

5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 104.0...106.0

1000 : (101.5...108.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 8.80  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1245...1275  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 300...510

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 650  
Rack travel in m: 9.80...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.80  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AG  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : BF12L513  
 1st version kw : 250.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 9.40...9.50  
 Del. quantity cm<sup>3</sup>/ : 9.4...9.6  
 100 s : (9.1...9.8)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 750  
 travel mm : 4.90...5.30  
 4th speed rpm : 1200  
 travel mm : 8.40...8.60  
 5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del. quantity : 94.0...96.0  
 1000 : (91.5...98.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

#### Testing:

1st rack travel in: 8.40  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 300...510

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 650  
Rack travel in m: 9.40...9.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.40  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 31.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 764AH  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1150PA820-1  
 Governor no. : 0 421 813 727

Customer-spec. information  
 Customer : KHD

Engine : 2F12L513

1st version kw : 307.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.60...10.70

Del. quantity cm<sup>3</sup>/ : 11.9...12.1

100 s: (11.6...12.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 750  
 travel mm : 4.90...5.30

4th speed rpm : 1200  
 travel mm : 8.40...8.60

5th speed rpm : 1300  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del. quantity : 119.0...121.0

1000 : (116.5...123.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 119...127

Testing:  
1st rack travel in: 9.60  
Speed rpm : 1190...1200  
2nd rack travel in: 5.50  
Speed rpm : 1155...1185  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 85...93

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 300...510

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.60...10.70  
2nd speed rpm : 650  
Rack travel in m: 10.60...10.80

START CUT-OUT  
Speed 1/min : 220 (240)

BREAKAWAY  
1st version  
1mm rack travel less than  
full load rack tr: 9.60  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY  
Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:  
:

On activation of the starting solenoid,  
the start position must be reached.



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 765AA  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1000PA907  
 Governor no. : 0 421 813 729

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 333.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

C01

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.40...11.50

Del. quantity cm<sup>3</sup>/ : 13.3...13.5

100 s : (13.0...13.7)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.60...1.90

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 750  
 travel mm : 5.20...5.60

4th speed rpm : 1050  
 travel mm : 7.90...8.10

5th speed rpm : 1120  
 travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 133.0...135.0

1000 : (130.5...137.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 10.40  
Speed rpm : 1040...1050  
2nd rack travel in: 5.50  
Speed rpm : 1095...1125  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 315...550

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 700  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 900  
Rack travel in m: 11.40...11.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 139.0...145.0  
1000 s: (136.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1040...1050

CO2

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 765AB  
 Injection pump  
 Pump designation : FE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1000PA907  
 Governor no. : 0 421 813 729

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 298.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 10.80...10.90  
 Del. quantity cm<sup>3</sup>/ : 11.8...12.0  
 100 s : (11.5...12.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.60...1.90  
 2nd speed rpm : 450  
 travel mm : 3.00...3.40  
 3rd speed rpm : 750  
 travel mm : 5.20...5.60  
 4th speed rpm : 1050  
 travel mm : 7.90...8.10  
 5th speed rpm : 1120  
 travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del. quantity : 118.0...120.0  
 1000 : (115.5...122.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1040...1050  
2nd rack travel in: 5.50  
Speed rpm : 1090...1120  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 315...550

#### TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 700  
Rack travel in m: 11.00...11.20  
3rd speed rpm : 900  
Rack travel in m: 10.80...11.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 123.0...129.0  
1000 s: (120.0...132.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1040...1050

CO4

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 765AC  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1000PA907  
 Governor no. : 0 421 813 729

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 284.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

C05

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.30...10.40

Del.quantity cm<sup>3</sup>/ : 11.1...11.3

100 s : (10.8...11.5)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.60...1.90

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 750  
 travel mm : 5.20...5.60

4th speed rpm : 1050  
 travel mm : 7.90...8.10

5th speed rpm : 1120  
 travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 111.0...113.0

1000 : (108.5...115.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 9.30  
Speed rpm : 1040...1050  
2nd rack travel in: 5.50  
Speed rpm : 1080...1110  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 315...550

#### TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 700  
Rack travel in m: 10.50...10.70  
3rd speed rpm : 900  
Rack travel in m: 10.30...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 114.0...120.0  
1000 s: (111.0...123.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1040...1050

006

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 765AD  
 Injection pump  
 Pump designation : PE12P110A92DLS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RGV300...1000PA907  
 Governor no. : 0 421 813 729

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 270.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

C07

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.00...10.10

Del. quantity cm<sup>3</sup>/ : 10.6...10.8

100 s : (10.3...11.0)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.60...1.90

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 750  
 travel mm : 5.20...5.60

4th speed rpm : 1050  
 travel mm : 7.90...8.10

5th speed rpm : 1120  
 travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 106.0...108.0

1000 : (103.5...110.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 9.00  
Speed rpm : 1040...1050  
2nd rack travel in: 5.50  
Speed rpm : 1080...1110  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 315...550

#### TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 700  
Rack travel in m: 10.20...10.40  
3rd speed rpm : 900  
Rack travel in m: 10.00...10.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 108.0...114.0  
1000 s: (105.0...117.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.00  
Speed rpm : 1040...1050

C08

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 765AF  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1000PA907  
 Governor no. : 0 421 813 729

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 313.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 11.20...11.30  
 Del. quantity cm<sup>3</sup>/ : 12.6...12.8  
 100 s : (12.3...13.0)

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.60...1.90  
 2nd speed rpm : 450  
 travel mm : 3.00...3.40  
 3rd speed rpm : 750  
 travel mm : 5.20...5.60  
 4th speed rpm : 1050  
 travel mm : 7.90...8.10  
 5th speed rpm : 1120  
 travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del. quantity : 126.0...128.0  
 1000 : (123.5...130.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 10.20  
Speed rpm : 1040...1050  
2nd rack travel in: 5.50  
Speed rpm : 1090...1120  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 315...550

#### TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 700  
Rack travel in m: 11.40...11.60  
3rd speed rpm : 900  
Rack travel in m: 11.20...11.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 130.0...136.0  
1000 s: (127.0...139.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1040...1050

C10

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 766AA  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV475...1075PA907-1  
 Governor no. : 0 421 813 739

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kw : 300.0  
 Rated speed : 2150

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1075

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 11.8...12.0

100 s : (11.5...12.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 475.0

Rack travel in mm : 6.4...6.6

Del. quantity cm<sup>3</sup>/ : 1.7...2.3

100 s : (1.4...2.5)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 475  
 travel mm : 1.10...1.50

2nd speed rpm : 650  
 travel mm : 3.40...4.00

3rd speed rpm : 950  
 travel mm : 5.60...6.20

4th speed rpm : 1100  
 travel mm : 7.70...7.90

5th speed rpm : 1150  
 travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

Del. quantity : 118.0...120.0

1000 : (115.5...122.5)

Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 9.50  
Speed rpm : 1095...1105  
2nd rack travel in: 6.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 475  
Rack travel in mm : 6.40...6.60

#### CONSTANT REGULATION

Speed rpm : 475...640

#### TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1075  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 800  
Rack travel in m: 10.80...11.00  
3rd speed rpm : 1000  
Rack travel in m: 10.60...10.80

#### START CUT-OUT

Speed 1/min : 395 (415)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 800  
Del. quantity cm3/ : 125.0...131.0  
1000 s: (122.0...134.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1095...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 767AA  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1150PA894-1  
 Governor no. : 0 421 801 485

Customer-spec. information  
 Customer : KHD

Engine : BF12L513 C

1st version kW : 367.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 14.7...14.9

100 s : (14.4...15.1)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 800

Del.quantity : 147.0...149.0

1000 : (144.5...151.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.00

Speed rpm : 1195...1210

2nd rack travel in: 5.50

Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 390...430

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.00...12.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 870  
Rack travel mm : 12.00...12.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 370  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 260  
Rack travel in m: 11.00...11.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1195...1210

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 767AB  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQ300/1150PA894-1  
 Governor no. : 0 421 801 485

Customer-spec. information  
 Customer : KHD

Engine : BF12L513 C  
 1st version kW : 351.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 11.60...11.70  
 Del. quantity cm<sup>3</sup>/ : 13.7...13.9  
 100 s : (13.4...14.1)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 800  
 Del. quantity : 137.0...139.0  
 1000 : (134.5...141.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 10.60  
 Speed rpm : 1195...1210  
 2nd rack travel in: 5.50

Speed rpm : 1235...1265  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 390...430

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 750  
Rack travel in m: 11.60...11.80

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 11.60...11.70

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 230  
Rack travel in m: 10.80...11.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 450  
Del. quantity cm<sup>3</sup>/ : 108.0...112.0  
1000 s: (105.5...114.5)

#### BREAKAWAY

C16

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1195...1210

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 9,7 f 1  
 Edition : 05.10.92  
 Replaces : 02.89  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 554  
 Injection pump  
 Pump designation : PE6P110A72DRS516  
 EP type number : 0 411 816 176  
 Governor  
 Governor design. : RQ300/1100PA412-2  
 Governor no. : 0 421 801 435

Customer-spec. information  
 Customer : HAEP

Engine : WD615.64

1st version kw : 175.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.40...14.50

Del. quantity cm<sup>3</sup>/ : 14.2...14.4

100 s: (13.9...14.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del. quantity cm<sup>3</sup>/ : 1.9...2.4

100 s: (1.6...2.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del. quantity : 142.0...144.0

1000 : (139.0...147.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1230...1260

4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### TORQUE CONTROL

Dimension a mm : 0.55  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 700  
Rack travel in m: 15.60...15.80  
3rd speed rpm : 1000  
Rack travel in m: 14.70...14.90  
4th speed rpm : 860  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 15.60...15.80

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 13.10...13.30  
2nd pressure hPa : 490  
Rack travel in m: 15.00...15.10  
3rd pressure hPa : 300  
Rack travel in m: 13.60...13.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 116.0...118.0  
1000 s: (113.0...121.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.50)

#### BREAKAWAY

1st version  
1mm rack travel less than:  
full load rack tr: 13.40  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...195.0  
1000 s: (171.0...199.0)

Remarks:

Delivery valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 10,0 g  
 Edition : 05.10.92  
 Replaces : 10.89  
 Test oil : ISO-4113

Combination no. : 0 401 846 912

Injection pump  
 Pump designation : PE6P110A72ORS3243  
 EP type number : 0 411 816 770  
 Governor  
 Governor design. : RQ300/1100PA412-4  
 Governor no. : 0 421 801 496

Customer-spec. information  
 Customer : HAEP

Engine : WD615.68

1st version kw : 228.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 18.3...18.5

100 s : (18.0...18.8)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.1

Del.quantity cm<sup>3</sup>/ : 1.5...2.1

100 s : (1.2...2.4)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 183.0...185.0

1000 : (180.0...188.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.70

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1240...1270

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 5.50  
Speed rpm : 300  
Rack travel in mm : 3.90...4.10  
Rack travel in mm : 2.00  
Speed rpm : 350...390

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 630  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 375  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 193.0...197.0  
1000 s: (190.0...200.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

C20

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 225.0...265.0  
1000 s: (221.0...269.0)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 10,0 h
Edition : 05.10.92
Replaces : 10.89
Test oil : ISO-4113
Combination no. : 0 401 846 913
Injection pump
Pump designation : PE6P110A72ORS3243
EP type number : 0 411 816 770
Governor
Governor design. : RQV250...1100PA413-5
Governor no. : 0 421 813 811

Customer-spec. information
Customer : HAEP

Engine : WD615.68

1st version kW : 228.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.70...13.80

Del.quantity cm3/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 3.9...4.1

Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.90...1.30

2nd speed rpm : 350
travel mm : 1.70...2.30

3rd speed rpm : 700
travel mm : 4.40...5.00

4th speed rpm : 1145
travel mm : 8.30...8.50

5th speed rpm : 1250
travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1200
Rack travel in mm : 11.40...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Aneroid pressure h: 1200
Del.quantity : 183.0...185.0
1000 : (180.0...188.0)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

#### Testing:

1st rack travel in: 12.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.50  
Speed rpm : 250  
Rack travel in mm : 3.90...4.10

#### CONSTANT REGULATION

Speed rpm : 250...350

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 630  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 375  
Rack travel in m: 10.70...10.90

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700

Del. quantity cm<sup>3</sup>/ : 193.0...197.0  
1000 s: (190.0...200.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 225.0...265.0  
1000 s: (221.0...269.0)

#### Remarks:

delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : SCA  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 926AA  
 Injection pump  
 Pump designation : PE6P110A720RS3040-2  
 EP type number : 0 411 816 774  
 Governor  
 Governor design. : RQV200...1000PA555-4  
 Governor no. : 0 421 813 878

Customer-spec. information  
 Customer : SCANIA

Engine : DS11

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 104  
 Opening  
 pressure, bar : 250...253  
 Orifice plate  
 diameter mm : 0,7  
 Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 3.30...3.40  
 : (3.25...3.45)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 12.30...12.40  
 Del.quantity cm<sup>3</sup>/ : 17.1...17.3  
 100 s : (16.9...17.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 6.5...6.9  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 1.10...1.50  
 2nd speed rpm : 350  
 travel mm : 2.30...2.90  
 3rd speed rpm : 700  
 travel mm : 4.70...5.30  
 4th speed rpm : 1050  
 travel mm : 8.40...8.60  
 5th speed rpm : 1165  
 travel mm : 9.90...10.30

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1070  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 171.0...173.0  
 1000 : (169.0...175.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 112...120

Testing:

1st rack travel in: 11.30

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1140...1170

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 65...73

Testing:

Speed rpm : 100

Minimum rack travel: 8.20

Speed rpm : 325

Rack travel in mm : 6.50...6.70

Rack travel in mm : 2.00

Speed rpm : 400...460

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 900

Rack travel mm : 12.30...12.40

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.80...10.20

2nd pressure hPa : 200

Rack travel in m: 11.70...11.80

3rd pressure hPa : 140

Rack travel in m: 10.70...10.90

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 112.0...116.0

1000 s: (110.0...118.0)

## BREAKAWAY

1st version

C24

1mm rack travel less than

full load rack tr: 11.30

Speed rpm : 1040...1050

## STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : 240.0...290.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 325

Rack travel in mm : 6.50...6.70

Remarks:

:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO diaphragm.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : HAE 12,0 a  
 Edition : 05.10.92  
 Replaces : 03.92  
 Test oil : ISO-4113  
  
 Combination no. : 0 401 846 933  
  
 Injection pump  
 Pump designation : PE6P110A32ORS3260  
 EP type number : 0 411 816 775  
 Governor  
 Governor design. : RQ250/1050PA969  
 Governor no. : 0 421 801 538

## Customer-spec. information

Customer : HAEP  
  
 Engine : X6130 NA

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 1 419 992 198  
  
 Inlet press., bar : 1.50  
  
 Test nozzle holder  
 assembly : 0 681 343 009  
  
 Opening  
 pressure, bar : 172...175  
  
 Test lines : 1 680 750 089  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
 Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 13.0...13.2

100 s : (12.7...13.4)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del.quantity cm<sup>3</sup>/ : 1.5...2.0

100 s : (1.2...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 500

Rack travel in mm : 12.60...14.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Del.quantity : 130.0...132.0

1000 : (127.5...134.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 500

Rack travel in mm : 13.4

Testing:

1st rack travel in: 10.40

Speed rpm : 1085...1100

2nd rack travel in: 4.00

Speed rpm : 1110...1140

4th rack travel in: 1250

Speed rpm : 0.00...1.80

LOW IDLE 1

Control lever  
position degrees: 73...81

Testing:

Speed rpm : 100  
Minimum rack travel: 9.30  
Speed rpm : 250  
Rack travel in mm : 7.70...7.90  
Rack travel in mm : 2.00  
Speed rpm : 275...335

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1035  
Rack travel in m: 11.30...11.50  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1035  
Del. quantity cm<sup>3</sup>/ : 129.5...133.5  
1000 s: (127.0...136.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1085...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.60...8.00  
Del. quantity cm<sup>3</sup>/ : 15.0...20.0  
1000 s: (12.5...22.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 950  
 Injection pump  
 Pump designation : PE6P110A72ORS3289  
 EP type number : 0 411 816 781  
 Governor  
 Governor design. : RQV200...1100PA555-5  
 Governor no. : 0 421 813 943

Customer-spec. information  
 Customer : SCANIA

Engine : DS11 63A

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 104  
 Opening  
 pressure, bar : 250...253  
 Orifice plate  
 diameter mm : 0.7  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 3.30...3.40  
 : (3.25...3.45)  
 Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 12.30...12.40  
 Del. quantity cm<sup>3</sup>/ : 17.1...17.3  
 100 s: (16.9...17.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 6.5...6.9  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.4  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

**(B) Setting of injection pump  
 with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 0.70...1.10  
 2nd speed rpm : 350  
 travel mm : 2.00...2.60  
 3rd speed rpm : 650  
 travel mm : 4.90...5.50  
 4th speed rpm : 1145  
 travel mm : 8.30...8.50  
 5th speed rpm : 1300  
 travel mm : 9.70...10.10

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del. quantity : 171.0...173.0  
 1000 : (169.0...175.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...120

### Testing:

1st rack travel in: 11.30  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1280...1310  
4th rack travel in: 1420  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 65...73

### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 325  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 400...430

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 200  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 140  
Rack travel in m: 10.70...10.90

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 160.0...168.0  
1000 s: (158.0...170.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 112.0...116.0  
1000 s: (110.0...118.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1140...1150

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.50...6.70

Remarks:

:

Delivery valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO  
diaphragm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DAF  
 Edition : 05.10.92  
 Replaces : 04.92  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 964  
 Injection pump  
 Pump designation : PE6P110A320RS3302  
 EP type number : 0 411 816 787  
 Governor  
 Governor design. : RQ300/1000PA1012-1  
 Governor no. : 0 421 801 648

Customer-spec. information  
 Customer : DAF

Engine : LT 195 L

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.00...15.00

D01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 3.90...4.10  
 & maximum rack tra: 13.9...14.9  
 Difference ° CS : 3.00...5.00

**BASIC SETTING**

1st speed rpm : 850  
 Rack travel in mm : 14.40...14.50  
 Del. quantity cm3/ : 17.3...17.5  
 100 s: (17.0...17.7)  
 Spread cm3 : 0.4  
 100 s: (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.5...5.7  
 Del. quantity cm3/ : 1.6...2.1  
 100 s: (1.4...2.4)  
 Spread cm3 : 0.4  
 100 s: (0.7)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del. quantity : 173.0...175.0  
 1000 : (170.5...177.5)  
 Spread cm3 : 4.00  
 1000 : (7.50)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 1025...1040  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 330...370

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.10...15.20  
2nd speed rpm : 1000  
Rack travel in m: 15.00...15.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.40...14.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 530  
Rack travel in m: 13.90...14.00  
3rd pressure hPa : 380  
Rack travel in m: 12.90...13.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.5...135.5)

#### BREAKAWAY

D02

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1025...1040

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 330.0...370.0  
1000 s: (327.0...373.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 16.5...21.5  
1000 s: (14.0...24.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 401 846 967

Injection pump  
 Pump designation : PE6P110A320LS3851-2  
 EP type number : 0 411 816 785  
 Governor  
 Governor design. : RQV350...1050PA378  
 -12  
 Governor no. : 0 421 814 016

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 151.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 12.20...12.30

---

Del. quantity cm<sup>3</sup>/ : 11.8...12.0  
 100 s: (11.5...12.2)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.3)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 7.1...7.7  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.4)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.1)

**(B) Setting of injection pump with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.30

2nd speed rpm : 455  
 travel mm : 3.40...3.90

3rd speed rpm : 880  
 travel mm : 5.60...6.10

4th speed rpm : 1107  
 travel mm : 8.00...8.50

5th speed rpm : 1209  
 travel mm : 9.80...10.20

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1130  
 Rack travel in mm : 9.90...12.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
Speed rpm : 1050  
Del. quantity : 118.0...120.0  
1000 : (115.5...122.5)  
Spread cm<sup>3</sup> : 8.50  
1000 : (13.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 67...75

Testing:  
Speed rpm : 250  
Minimum rack trave: 10.00

CONSTANT REGULATION  
Speed rpm : 350...450

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 119.0...125.0  
1000 s: (116.5...127.5)  
Spread cm<sup>3</sup> : 11.00  
1000 s: (14.)  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 88.0...90.0 \*  
1000 s: (85.5...92.5)  
Spread cm<sup>3</sup> : 11.00  
1000 s: (14.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1090...1100

D04

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

\* = Set at reduced-delivery stop.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 12,8 c1  
Edition : 25.09.92  
Replaces : 01.92  
Test oil : ISO-4113  
  
Combination no. : 0 401 848 820  
  
Injection pump  
Pump designation : PE8P120A720LS3281-1  
EP type number : 0 411 828 727  
Governor  
Governor design. : RQV300...1050PA1009  
Governor no. : 0 421 813 938

Customer-spec. information  
Customer : KHD

Engine : BF8L513LC

1st version kW : 243.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
                  : (3.65...3.85)  
Rack travel in mm : 13.00...14.00  
Firing order : 1- 8- 7- 2- 6- 5-  
                  4- 3

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  

---

Rack travel in mm : 12.70...12.80  

---

Del. quantity cm<sup>3</sup>/ : 18.6...18.8  
100 s : (18.3...19.1)

Spread cm<sup>3</sup> : 0.5  

---

100 s : (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.1  
Del. quantity cm<sup>3</sup>/ : 3.0...3.6  
100 s : (2.7...3.9)  
Spread cm<sup>3</sup> : 0.8  
100 s : (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 2.40...2.80  
2nd speed rpm : 450  
travel mm : 3.40...4.00  
3rd speed rpm : 725  
travel mm : 5.30...5.90  
4th speed rpm : 1100  
travel mm : 9.10...9.30  
5th speed rpm : 1175  
travel mm : 10.00...10.40

## GUIDE SLEEVE POSITION

Control-Lever position  
Degree: -1  
Speed rpm : 1070  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050

Aneroid pressure h: 850  
Del. quantity : 186.0...188.0  
                  1000 : (183.0...191.0)  
Spread cm<sup>3</sup> : 5.00  
                  1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 86...94

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 650  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 775  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 850  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 450  
Rack travel in m: 12.50...12.60

3rd pressure hPa : 310  
Rack travel in m: 12.00...12.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 850  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 186.0...190.0  
                  1000 s: (183.0...193.0)  
Aneroid pressure h: --  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 124.0...126.0  
                  1000 s: (121.0...129.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 11.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 175.0...195.0  
                  1000 s: (175.0...195.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : HAE  
Edition : 05.10.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 401 856 159  
  
Injection pump  
Pump designation : PE6P110A721RS369  
EP type number : 0 411 816 121  
Governor  
Governor design. : RQ300/1300PA412-6  
Governor no. : 0 421 801 638

Customer-spec. information  
Customer : HAEP

Engine : WD615.60

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test lines : 1 680 750 089  
  
Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300  

---

Rack travel in mm : 14.10...14.20  

---

Del. quantity cm<sup>3</sup>/ : 14.6...14.8  
100 s : (14.3...15.0)  

---

Spread cm<sup>3</sup> : 0.4  
100 s : (0.7)

2nd speed rpm : 300.0  
Rack travel in mm : 8.8...9.2  
Del. quantity cm<sup>3</sup>/ : 1.8...2.4  
100 s : (1.5...2.6)  
Spread cm<sup>3</sup> : 0.4  
100 s : (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 600  
Rack travel in mm : 15.80...17.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 700  
Del. quantity : 146.0...148.0  
1000 : (143.5...150.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 16.4  
  
Testing:  
1st rack travel in: 13.10  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack trave: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 400...440

TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 700  
Rack travel in m: 14.60...15.00  
3rd speed rpm : 900  
Rack travel in m: 14.50...14.70  
4th speed rpm : 1100  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 700  
Pressure hPa : 700  
Rack travel mm : 14.30...14.50

Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 310  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 205  
Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm3/ : 135.0...139.0  
1000 s: (132.0...142.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 101.0...103.0  
1000 s: (98.5...105.5)

BREAKAWAY

D08

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (131.0...159.0)  
Rack travel in mm : 16.50...17.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 401 876 770B

Injection pump  
 Pump designation : PE6P110A320LS3852  
 EP type number : 0 411 816 768  
 Governor  
 Governor design. : RSV400...900P1A544  
 Governor no. : 0 421 833 326

Cust. part no. : 9270100

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 9306 T

1st version kW : 172.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90  
 : (3.75...3.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 3- 5- 2- 4

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.50...12.60

Del. quantity cm<sup>3</sup>/ : 14.8...15.0

100 s : (14.5...15.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 5.8...6.0

Del. quantity cm<sup>3</sup>/ : 1.3...1.8

100 s : (1.0...2.0)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del. quantity : 148.0...150.0

1000 : (145.5...152.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 88...96

Testing:

1st rack travel in: 11.50

Speed rpm : 930...940  
2nd rack travel in: 4.00  
Speed rpm : 945...975  
3rd rack travel in: 4.00  
Speed rpm : 950...980  
4th rack travel in: 1120  
Speed rpm : 0.30...1.40

Remarks:

#### LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4  
Speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 450...510

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 500  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 420  
Rack travel in m: 13.70...14.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (141.0...151.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 930...940

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...170.0  
1000 s: (146.0...174.0)

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 13.0...18.0  
1000 s: (10.5...20.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,0 z  
Edition : 25.09.92  
Replaces : 06.91  
Test oil : ISO-4113  
  
Combination no. : 0 401 876 775  
  
Injection pump  
Pump designation : PE6P110A320LS3835-3  
EP type number : 0 411 816 773  
Governor  
Governor design. : RSV350...1050POA556  
Governor no. : 0 421 833 388

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 441

1st version kW : 165.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
                  : (3.95...4.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 13.6...13.8

100 s: (13.3...14.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 8.3...8.9

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Del.quantity : 136.0...138.0

1000 : (133.5...140.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 88...96

Testing:

1st rack travel in: 12.50

Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

Observe VDT-I-420/120

#### LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 8.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 8.50...8.70  
Rack travel in mm : 2.00  
Speed rpm : 380...440

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 124.0...128.0  
1000 s: (121.0...131.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

#### Remarks:

:

Set 14.1...14.3 mm control-rod travel  
at lower full-load stop with  
n = 1030 1/min.  
Make full-load setting at upper full-  
load stop in accordance with test  
specifications.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 s 3  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 401 878 716

Injection pump  
 Pump designation : PE8P110A320LS3842-1  
 EP type number : 0 411 818 716  
 Governor  
 Governor design. : RSV675...1050POA823  
 -2

Governer no. : 0 421 833 365

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 33...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 Phasing : 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup>/ : 14.1...14.3

100 s: (13.8...14.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 675.0  
 Rack travel in mm : 4.8...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s: (1.2...2.3)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1030  
 Del.quantity : 141.0...143.0  
 1000 : (138.5...145.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 88...96

Testing:

1st rack travel in: 12.00  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1100...1118  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 675  
Rack travel in mm : 5.1

Testing:

Speed rpm : 100  
Minimum rack travel: 15.00  
Speed rpm : 675  
Rack travel in mm : 4.80...5.40

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 132.0...136.0  
1000 s: (129.0...139.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (8.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

APPLICATION

Combine-harvester

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAN 11,9 r2  
 Edition : 14.10.92  
 Replaces : 18.02.91  
 Test oil : ISO-4113

Combination no. : 0 402 036 735

Injection pump  
 Pump designation : PES6P120A720/3LS3250  
 -1  
 EP type number : 0 412 026 742  
 Governor  
 Governor design. : RQ300/1000PA813-13  
 Governor no. : 0 421 801 529

**Customer-spec. information**  
 Customer : MAN

Engine : D2866LF03/LUHD1

1st version kw : 273.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 5.90...6.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.00...4.00

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 15.00...15.10

---

Del.quantity cm<sup>3</sup>/ : 24.2...24.4

---

100 s: (23.9...24.7)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 4.8...5.2  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2

Speed rpm : 650  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 242.0...244.0  
 1000 : (239.0...247.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 650  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.00  
Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 700  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 13.70...14.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 241.0...247.0  
1000 s: (238.0...250.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1045...1060

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7050X

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 9,8 a 6  
 Edition : 21.09.92  
 Replaces : 02.92  
 Test oil : ISO-4113

Combination no. : 0 402 046 313

Injection pump  
 Pump designation : PES6P120A320RS419  
 EP type number : 0 412 026 037  
 Governor  
 Governor design. : RQV275...1050PA495-8  
 Governor no. : 0 421 813 482

Customer-spec. information  
 Customer : RVI

Engine : MIDS062045

1st version kW : 169.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 118

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 10.40...10.50

---

Del.quantity cm<sup>3</sup>/ : 18.0...18.2  
 100 s : (17.7...18.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 2.3...2.7  
 100 s : (2.0...3.0)

Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.00...1.20  
 2nd speed rpm : 450  
 travel mm : 3.30...3.80  
 3rd speed rpm : 800  
 travel mm : 5.70...6.00  
 4th speed rpm : 1050  
 travel mm : 7.60...7.80

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 700  
 Del.quantity : 180.5...182.5  
 1000 : (177.5...185.5)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1125...1135  
2nd rack travel in: 4.10  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.60  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 275...390

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.40...10.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 360  
Rack travel in m: 9.90...10.00  
3rd pressure hPa : 160  
Rack travel in m: 8.70...9.00

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 184.0...189.0  
1000 s: (181.0...191.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 112.5...114.5  
1000 s: (109.5...117.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 1125...1135

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 151.0...171.0  
1000 s: (147.0...175.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 23.5...27.5  
1000 s: (20.5...30.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9.5° cam angle  
after start of delivery cyl. 1

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 8,1 a 1  
 Edition : 22.05.92  
 Replaces : 11.91  
 Test oil : ISO-4113

Combination no. : 0 402 046 346

Injection pump  
 Pump designation : PES6P110A72ORS530  
 EP type number : 0 412 016 075  
 Governor  
 Governor design. : RQV450...1000PA1016-  
 2  
 Governor no. : 0 421 813 967

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8365.25.532

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 9.80...9.90

Del. quantity cm<sup>3</sup>/ : 11.6...11.8  
 100 s : (11.4...12.1)

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 450.0

Rack travel in mm : 5.4...5.8

Del. quantity cm<sup>3</sup>/ : 1.7...2.2  
 100 s : (1.4...2.4)

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1095  
 travel mm : 6.70...6.90

2nd speed rpm : 450  
 travel mm : 0.70...1.10

3rd speed rpm : 700  
 travel mm : 3.30...3.90

4th speed rpm : 850  
 travel mm : 4.80...5.20

5th speed rpm : 1650  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1430

Rack travel in mm : 8.50...11.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 700

Del. quantity : 116.5...118.5  
 1000 : (114.0...121.0)

Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

## RATED SPEED

1st version  
Control Lever  
position degrees: 96...106

Testing:  
1st rack travel in: 8.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control Lever  
position degrees: 66...74

Testing:  
Speed rpm : 375  
Minimum rack travel: 7.70  
Speed rpm : 450  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 510...570

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 9.80...9.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 400  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 380  
Rack travel in m: 9.30...9.50

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 700  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 113.0...117.0  
1000 s: (110.0...120.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 97.0...99.0  
1000 s: (94.5...101.5)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 195.0...225.0  
1000 s: (191.0...229.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 8,1 a 3  
 Edition : 22.01.92  
 Replaces : 12.91  
 Test oil : ISO-4113

Combination no. : 0 402 046 347

Injection pump  
 Pump designation : PES6P110A72ORS530  
 EP type number : 0 412 016 075  
 Governor  
 Governor design. : RQV450...1075PA1016  
 -3  
 Governor no. : 0 421 813 968

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8365.25.584

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1075

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 12.2...12.4

100 s : (11.9...12.6)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 450.0

Rack travel in mm : 6.0...6.4

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s : (1.4...2.4)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1135

travel mm : 7.00...7.20

2nd speed rpm : 450

travel mm : 0.70...1.10

3rd speed rpm : 700

travel mm : 3.30...3.90

4th speed rpm : 950

travel mm : 5.60...6.00

5th speed rpm : 1650

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1430

Rack travel in mm : 8.50...11.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

Aneroid pressure h: 700

Del.quantity : 122.0...124.0

1000 : (119.5...126.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 96...104

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1130...1140  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 350  
Minimum rack travel: 9.00  
Speed rpm : 450  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 490...550

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.80...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 480  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 440  
Rack travel in m: 9.90...10.10

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 126.0...130.0  
1000 s: (123.0...133.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 93.0...95.0  
1000 s: (90.5...97.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1130...1140

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 185.0...215.0  
1000 s: (181.0...219.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : UNI 8,3 a 4  
 Edition : 25.09.92  
 Replaces : 11.91  
 Test oil : ISO-4113

Combination no. : 0 402 046 348

Injection pump  
 Pump designation : PES6P110A72ORS530  
 EP type number : 0 412 016 075  
 Governor  
 Governor design. : RQV450...1100PA1016  
 -4  
 Governor no. : 0 421 813 969

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8365.25.533

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 11.10...11.20

---

Del.quantity cm3/ : 13.8...14.0

---

100 s: (13.5...14.2)

---

Spread cm3 : 0.4

---

100 s: (0.7)

---

2nd speed rpm : 450.0

Rack travel in mm : 5.9...6.6

Del.quantity cm3/ : 1.7...2.2

100 s: (1.4...2.4)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1145  
 travel mm : 6.80...7.00

2nd speed rpm : 450  
 travel mm : 1.20...1.60

3rd speed rpm : 700  
 travel mm : 3.30...3.90

4th speed rpm : 950  
 travel mm : 5.50...5.90

5th speed rpm : 1650  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1460

Rack travel in mm : 8.80...11.40

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 700

Aneroid pressure h: 700

Del.quantity : 138.0...140.0

1000 : (135.5...142.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 96...104

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 325  
Minimum rack travel: 9.60  
Speed rpm : 450  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION  
Speed rpm : 470...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 480  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 440  
Rack travel in m: 10.30...10.50

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 133.0...137.0  
1000 s: (130.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 111.0...113.0  
1000 s: (108.5...115.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1140...1150

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 185.0...215.0  
1000 s: (181.0...219.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 807A  
 Injection pump  
 Pump designation : PES6P110A820LS3131  
 EP type number : 0 412 016 715  
 Governor  
 Governor design. : RQV300...1100PA916  
 Governor no. : 0 421 813 748

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447C

1st version kW : 177.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 13.7...13.9

100 s: (13.4...14.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.6...7.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300

travel mm : 1.10...1.40

2nd speed rpm : 450

travel mm : 3.40...3.80

3rd speed rpm : 1150

travel mm : 7.90...8.30

4th speed rpm : 1225

travel mm : 9.10...9.70

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Del.quantity : 137.0...139.0

1000 : (134.5...141.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (8.00)

Remarks:

#### RATED SPEED

1st version  
Control Lever  
position degrees: 114...122

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 85...93

Testing:  
Speed rpm : 200  
Minimum rack travel: 9.20  
Speed rpm : 300  
Rack travel in mm : 7.60...7.80

CONSTANT REGULATION  
Speed rpm : 300...500

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 113.0...116.0  
1000 s: (110.0...119.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 046 837

Injection pump  
 Pump designation : PES6P100A320RS3304  
 EP type number : 0 412 006 702  
 Governor  
 Governor design. : RQV350...1200PA1037K  
 Governor no. : 0 421 815 312

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 210.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.50

Overflow  
 quantity min. 1/h: 240...260

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 3.35...3.45  
 : (3.30...3.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 13.50...13.60

Del. quantity cm<sup>3</sup>/ : 14.8...15.0

100 s: (14.6...15.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del. quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (1.8...2.7)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.40...1.60

2nd speed rpm : 500  
 travel mm : 3.20...3.60

3rd speed rpm : 800  
 travel mm : 5.60...6.00

4th speed rpm : 1265  
 travel mm : 8.70...8.90

5th speed rpm : 1460  
 travel mm : 10.40...10.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 900  
 Del. quantity : 148.0...150.0  
 1000 : (146.0...152.0)

Spread cm<sup>3</sup> : 4.00  
1000 : (6.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 61...69

#### Testing:

1st rack travel in: 12.50  
Speed rpm : 1240...1270  
2nd rack travel in: 4.00  
Speed rpm : 1430...1440  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 18...26

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 800  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 650  
Rack travel in m: 12.80...13.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 800  
Pressure hPa : 900  
Rack travel mm : 13.40...13.60

#### Measurement

Speed 1/min : 800

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 240  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 455  
Rack travel in m: 12.10...12.50

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...78.0  
1000 s: (72.0...80.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1240...1270

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0...155.0  
1000 s: (110.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: NAVISTAR #1818499C91  
Limit shutoff stop screw to 1.0 mm.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER
Edition : 21.09.92
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 046 840
Injection pump
Pump designation : PES6P120A320RS3307
EP type number : 0 412 026 757
Governor
Governor design. : RGV250...950PA794-3
Governor no. : 0 421 814 015

Customer-spec. information
Customer : PERKINS

Engine : EAGLE TX 300/335

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 067
Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 3.50...3.60
: (3.45...3.65)
Rack travel in mm : 12.00...13.00

EO1

Firing order : 1- 4- 2- 6- 3- 5
Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
Rack travel in mm : 14.60...14.70
Del.quantity cm3/ : 22.3...22.5
100 s: (22.0...22.8)
Spread cm3 : 0.6
100 s: (0.9)
2nd speed rpm : 250.0
Rack travel in mm : 5.9...6.1
Del.quantity cm3/ : 1.3...1.7
100 s: (1.0...2.0)
Spread cm3 : 0.3
100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.90...1.40
2nd speed rpm : 350
travel mm : 2.00...2.50
3rd speed rpm : 660
travel mm : 3.70...4.20
4th speed rpm : 985
travel mm : 7.40...7.60
5th speed rpm : 1260
travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1110
Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 900
Aneroid pressure h: 1200
Del.quantity : 223.0...225.0
1000 : (220.0...228.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.30  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 150  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 340  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 220  
Rack travel in m: 9.90...10.10

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600

E02

Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (126.0...174.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE  
 Edition : 21.09.92  
 Replaces : 04.92  
 Test oil : ISO-4113

Combination no. : 0 402 076 745

Injection pump  
 Pump designation : PES6P120A720RS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV625...1100P2A534  
 -9  
 Governor no. : 0 421 833 372

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 HZ 031

1st version kw : 205.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

E03

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 12.80...12.90

---

Del. quantity cm<sup>3</sup>/ : 17.6...17.8  
 100 s : (17.4...18.0)

---

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.6)

2nd speed rpm : 625.0  
 Rack travel in mm : 5.4...5.6  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.1  
 100 s : (2.5...3.3)

Spread cm<sup>3</sup> : 0.6  
 100 s : (0.8)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del. quantity : 176.5...178.5  
 1000 : (174.5...180.5)

Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 42...50

Testing:

1st rack travel in: 11.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 625  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 625  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 700  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 645  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 840  
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm3/ : 189.0...193.0  
1000 s: (187.0...195.0)

Aneroid pressure h: -  
Speed rpm : 800

E04

Del.quantity cm3/ : 143.0...147.0  
1000 s: (141.0...149.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 625  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 27.0...31.0  
1000 s: (25.0...33.0)  
Spread cm3 : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47399

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DEE  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 747  
 Injection pump  
 Pump designation : PES6P110A72ORS3224-1  
 EP type number : 0 412 016 739  
 Governor  
 Governor design. : RSV475...1100P2A534  
 -11  
 Governor no. : 0 421 833 377

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6101 AT 001

1st version kW : 170.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X3.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 27...29

E05

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 13.30...13.40

Del. quantity cm<sup>3</sup>/ : 16.2...16.4

100 s: (16.0...16.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 475.0

Rack travel in mm : 5.6...5.8

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Aneroid pressure h: 600

Del. quantity : 162.0...164.0

1000 : (160.0...166.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

**RATED SPEED**

1st version

Control lever

position degrees: 40...48

Testing:  
1st rack travel in: 12.30  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 475  
Rack travel in mm : 5.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 475  
Rack travel in mm : 5.60...5.80

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 600  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 600  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.90...12.10  
2nd pressure hPa : 265  
Rack travel in m: 13.30...13.40  
3rd pressure hPa : 135  
Rack travel in m: 12.30...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 600  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 177.0...181.0  
1000 s: (175.0...183.0)  
Aneroid pressure h: -  
Speed rpm : 500

E06

Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (120.0...150.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 475  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks: : JOHN DEERE # RE51966

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

#### APPLICATION

Wheel loader

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE  
 Edition : 21.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 075 748A  
 Injection pump  
 Pump designation : PES6P110A72DRS3305  
 EP type number : 0 412 016 740  
 Governor  
 Governor design. : RSV300...1100P1A555  
 Governor no. : 0 421 833 379

Cust. part no. : 9271056

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 926 TI

1st version kW : 210.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 15.30...15.40

Del.quantity cm<sup>3</sup>/ : 18.3...18.5

100 s: (18.0...18.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 7.3...7.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1300

Del.quantity : 183.0...185.0

1000 : (180.5...187.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 14.30  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
3rd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1260  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.9  
Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 560...620

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 500  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 550  
Pressure hPa : 1300  
Rack travel mm : 15.30...15.40

Measurement

Speed 1/min : 550

1st pressure hPa : -  
Rack travel in m: 13.40...13.60  
2nd pressure hPa : 510  
Rack travel in m: 13.70...13.80  
3rd pressure hPa : 640  
Rack travel in m: 14.90...15.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.5...153.5)

BREAKAWAY

1st version

E08

1mm rack travel less than  
full load rack tr: 14.30  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (141.0...169.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 21.09.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 076 748E  
Injection pump  
Pump designation : PES6P110A720RS3305  
EP type number : 0 412 016 740  
Governor  
Governor design. : RSV300...1100P1A555  
Governor no. : 0 421 833 379

Cust. part no. : 9273248

Customer spec. information  
Customer : LIEBHERR

Engine : D 926 TI

1st version kW : 200.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
                  : (3.45...3.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.00...15.10

Del. quantity cm<sup>3</sup>/ : 17.8...18.0

100 s : (17.5...18.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 7.3...7.5

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s : (0.7...1.8)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1300

Del. quantity : 178.0...180.0

1000 : (175.5...182.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 14.00  
Speed rpm : 920...930  
2nd rack travel in: 4.00  
Speed rpm : 955...985  
3rd rack travel in: 4.00  
Speed rpm : 985...1005  
4th rack travel in: 1260  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.9  
Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 560...620

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 500  
Rack travel in m: 13.60...13.80

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : 1300  
Rack travel mm : 15.00...15.10

#### Measurement

Speed 1/min : 550

1st pressure hPa : -  
Rack travel in m: 13.80...14.00  
2nd pressure hPa : 550  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 650  
Rack travel in m: 14.60...14.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 164.0...166.0  
1000 s: (161.5...168.5)

#### BREAKAWAY

#### 1st version

E10

1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 920...930

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (141.0...169.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 12,9 c  
Edition : 21.09.92  
Replaces : 02.90  
Test oil : ISO-4113

Combination no. : 0 402 636 800

Injection pump  
Pump designation : PE6P130A720/3LS7827  
EP type number : 0 412 636 814  
Governor  
Governor design. : RGV400...1150PA937  
Governor no. : 0 421 813 823

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 8262.43.001

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
: (5.05...5.25)  
Rack travel in mm : 9.00...12.00

E11

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 26.8...27.1

100 s: (26.4...27.4)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.2

Del. quantity cm<sup>3</sup>/ : 2.1...2.7

100 s: (1.7...3.1)

Spread cm<sup>3</sup> : 1.0

100 s: (1.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 2.60...3.00

2nd speed rpm : 500  
travel mm : 4.20...4.80

3rd speed rpm : 650  
travel mm : 5.80...6.40

4th speed rpm : 900  
travel mm : 6.70...7.00

5th speed rpm : 1350  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 850

Rack travel in mm : 16.50...18.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1200

Del. quantity : 268.0...271.0

1000 : (264.5...274.5)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 106...114

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 400  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 400...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 11.70...11.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.50...8.70  
2nd pressure hPa : 650  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 250  
Rack travel in m: 9.20...9.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 275.0...282.0  
1000 s: (271.5...285.5)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 165.0...168.0  
1000 s: (161.5...171.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1190...1200

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 21.0...27.0  
1000 s: (17.0...31.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

#### Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

#### APPLICATION

Special-purpose vehicle

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE  
Edition : 21.09.92  
Replaces : 05.92  
Test oil : ISO-4113

Combination no. : 0 402 638 807

Injection pump  
Pump designation : PE8P120A120LS7127  
EP type number : 0 412 628 817  
Governor  
Governor design. : RQ300/1100PA134-3  
Governor no. : 0 421 801 655

Customer-spec. information  
Customer : SNF

Engine : WD 815.72/73

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 9.00...12.00

E13

Firing order : 1- 5- 4- 8- 6- 3-  
                  7- 2

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.80...13.90

Del.quantity cm<sup>3</sup>/ : 20.5...20.7

100 s : (20.2...21.0)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...7.0

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.40...16.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 205.0...207.0

1000 : (202.0...210.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.80

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.40  
2nd pressure hPa : 790  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 490  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 142.0...144.0  
1000 s: (139.0...147.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 180.0...210.0  
1000 s: (176.0...214.0)  
Rack travel in mm : 15.00...16.00

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE  
 Edition : 21.09.92  
 Replaces : 05.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 638 808  
 Injection pump  
 Pump designation : PE8P120A120LS7127  
 EP type number : 0 412 628 817  
 Governor  
 Governor design. : RQV250...1100PA785-3  
 Governor no. : 0 421 814 004

Customer-spec. information  
 Customer : SNF

Engine : WD 815.72/73

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 105  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 089  
 Outside diameter x Wall thickness x Length mm : 8.00X2.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

E15

Firing order : 1- 5- 4- 8- 6- 3-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 13.80...13.90  
 Del.quantity cm<sup>3</sup>/ : 20.5...20.7  
 100 s : (20.2...21.0)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.2  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.9  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.40  
 2nd speed rpm : 355  
 travel mm : 1.70...2.20  
 3rd speed rpm : 410  
 travel mm : 2.20...2.70  
 4th speed rpm : 1150  
 travel mm : 8.30...8.70  
 5th speed rpm : 1390  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1220  
 Rack travel in mm : 11.50...14.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 205.0...207.0  
 1000 : (202.0...210.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 103...111

Testing:  
1st rack travel in: 12.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78

Testing:  
Speed rpm : 150  
Minimum rack travel: 8.80  
Speed rpm : 250  
Rack travel in mm : 6.80...7.00

CONSTANT REGULATION  
Speed rpm : 350...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.40  
2nd pressure hPa : 790  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 520  
Rack travel in m: 10.70...10.90

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 142.0...144.0  
1000 s: (139.0...147.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...210.0  
1000 s: (176.0...214.0)  
Rack travel in mm : 15.00...16.00

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 841  
 Injection pump  
 Pump designation : PE12P120A320LS7855  
 EP type number : 0 412 620 835  
 Governor  
 Governor design. : RQ400/1065PA1024  
 Governor no. : 0 421 801 634

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 485.0  
 Rated speed : 2130

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 1065  
 Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 21.1...21.3  
 100 s: (20.8...21.6)

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 400.0  
 Rack travel in mm : 4.8...5.4  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 14.60...17.20

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1065  
 Aneroid pressure h: 1000  
 Del.quantity : 211.0...213.0  
 1000 : (208.0...216.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:

Speed rpm : 600  
Rack travel in mm : 15.9

Testing:

1st rack travel in: 12.90  
Speed rpm : 1110...1125  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.1

Testing:

Speed rpm : 300  
Minimum rack trave: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 465...505

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.80...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 320 (340)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 205.0...209.0  
1000 s: (202.0...212.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 144.0...146.0  
1000 s: (141.0...149.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1110...1125

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

APPLICATION

Rail car

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : UNI  
 Edition : 05.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 605  
 Injection pump  
 Pump designation : PE6P130A72ORS7197  
 EP type number : 0 412 636 815  
 Governor  
 Governor design. : RQV300...1000PA946-2  
 Governor no. : 0 421 814 021

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8210.22.800

1st version kw : 224.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 11.90...12.00

Del. quantity cm<sup>3</sup>/ : 21.2...21.4

100 s : (20.9...21.7)

Spread cm<sup>3</sup> : 0.5

100 s : (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 5.0...5.4

Del. quantity cm<sup>3</sup>/ : 1.9...2.5

100 s : (1.5...2.9)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1045  
 travel mm : 8.30...8.50

2nd speed rpm : 300  
 travel mm : 1.10...1.30

3rd speed rpm : 400  
 travel mm : 2.30...2.90

4th speed rpm : 700  
 travel mm : 4.90...5.50

5th speed rpm : 1350  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 9.60...12.20

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 900

Del.quantity : 212.0...214.0  
1000 : (209.0...217.0)  
Spread cm3 : 5.00  
1000 : (8.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 10.90  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 390...430

CONSTANT REGULATION  
Speed rpm : 410...530

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.90...12.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 360  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 265  
Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 550

E20

Del.quantity cm3/ : 214.0...220.0  
1000 s: (211.0...223.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 161.0...163.0  
1000 s: (158.0...166.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...260.0  
1000 s: (216.0...264.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 646 796  
  
 Injection pump  
 Pump designation : PE6P120A320LS7858  
 EP type number : 0 412 626 875  
 Governor  
 Governor design. : RQ300/1050PA1030-5  
 Governor no. : 0 421 801 665

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 18.9...19.1

100 s: (18.6...19.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del. quantity : 189.0...191.0

1000 : (186.0...194.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...10.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.10...10.20  
2nd pressure hPa : 350  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 181.0...185.0  
1000 s: (178.0...188.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1090...1105

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 21.09.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 797  
  
Injection pump  
Pump designation : PE6P120A320LS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQ300/1050PA1030-4  
Governor no. : 0 421 801 664

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
                  : (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del. quantity cm<sup>3</sup>/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del. quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 700  
Rack travel in m: 11.10...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

E24

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 50.0...80.0  
1000 s: (46.0...84.0)  
Rack travel in mm : 10.00...10.30

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 798  
 Injection pump  
 Pump designation : PE6P120A320LS7854  
 EP type number : 0 412 626 872  
 Governor  
 Governor design. : RQV350...950PA870-17  
 Governor no. : 0 421 814 005

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 14.50...14.60

Del. quantity cm<sup>3</sup>/ : 25.1...25.3

100 s: (24.8...25.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80

2nd speed rpm : 570  
 travel mm : 3.90...4.40

3rd speed rpm : 850  
 travel mm : 5.70...6.20

4th speed rpm : 1008  
 travel mm : 7.40...7.90

5th speed rpm : 1110  
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 950  
Aneroid pressure h: 1200  
Del.quantity : 251.0...253.0  
1000 : (248.0...256.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 13.50  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 250  
Minimum rack travel: 7.70  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 350...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.40...11.50  
2nd pressure hPa : 600  
Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 263.0...267.0  
1000 s: (260.0...270.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

APPLICATION

Pistenbully

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA  
 Edition : 21.09.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 910  
 Injection pump  
 Pump designation : PE6P120A32ORS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV200...1100PA712-5  
 Governor no. : 0 421 813 951

Customer-spec. information  
 Customer : SCANIA

Engine : DS9 08

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 104  
 Opening  
 pressure, bar : 250...253  
 Orifice plate  
 diameter mm : 0,7  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.00...13.10  
 Del.quantity cm<sup>3</sup>/ : 18.0...18.2  
 100 s: (17.7...18.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.2...1.6  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.50...3.10  
 3rd speed rpm : 650  
 travel mm : 5.40...6.00  
 4th speed rpm : 1145  
 travel mm : 8.90...9.10  
 5th speed rpm : 1280  
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 180.0...182.0  
 1000 : (177.0...185.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 480  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 220  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 114.0...118.0  
1000 s: (112.0...120.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...140.0  
1000 s: (-)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t12  
 Edition : 21.09.92  
 Replaces : 05.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 945  
 Injection pump  
 Pump designation : PE6P120A320LS7808-2  
 EP type number : 0 412 626 833  
 Governor  
 Governor design. : RQV350...950PA870-11  
 Governor no. : 0 421 813 928

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 243.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80

2nd speed rpm : 570  
 travel mm : 3.90...4.40

3rd speed rpm : 850  
 travel mm : 5.70...6.20

4th speed rpm : 1008  
 travel mm : 7.40...7.90

5th speed rpm : 1110  
 travel mm : 9.60...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 12.50...15.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 214.0...216.0  
1000 : (211.0...219.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

#### Testing:

1st rack travel in: 13.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 63...71

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

#### CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 550  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 1100  
Rack travel in m: 14.10...14.30  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

#### START CUT-OUT

FO2

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 240.0...243.0  
1000 s: (237.0...246.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 237.0...241.0  
1000 s: (234.0...244.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 200.0...202.0 \*  
1000 s: (197.0...205.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

\* = Set at reduced-delivery stop.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : PEN 7,2 a  
 Edition : 21.09.92  
 Replaces : 10.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 948  
 Injection pump  
 Pump designation : PE6P120A320RS7233-1  
 EP type number : 0 412 626 849  
 Governor  
 Governor design. : RQV300...1300PA1003K  
 Governor no. : 0 421 815 281

Customer-spec. information  
 Customer : PENTA

Engine : TAMD 72 A

1st version kW : 316.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40  
 : (3.25...3.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 13.80...13.90  
 Del. quantity cm<sup>3</sup>/ : 24.9...25.1  
 100 s : (24.6...25.4)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (1.0)  
 2nd speed rpm : 290.0  
 Rack travel in mm : 5.8...6.0  
 Del. quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s : (1.3...2.3)  
 Spread cm<sup>3</sup> : 0.7  
 100 s : (1.1)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 275  
 travel mm : 1.30...1.50  
 2nd speed rpm : 325  
 travel mm : 2.00...2.20  
 3rd speed rpm : 475  
 travel mm : 3.20...3.40  
 4th speed rpm : 890  
 travel mm : 6.30...6.50  
 5th speed rpm : 1350  
 travel mm : 9.90...10.10

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1500  
 Rack travel in mm : 6.00...12.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 2400

Del. quantity : 249.0...251.0  
1000 : (246.0...254.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 12.80  
Speed rpm : 1335...1345  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 75...79

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.80...6.00

#### CONSTANT REGULATION

Speed rpm : 300...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 1200  
Rack travel in m: 13.40...13.70  
3rd speed rpm : 1000  
Rack travel in m: 12.30...12.70  
4th speed rpm : 800  
Rack travel in m: 11.40...11.60

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 1300  
Pressure hPa : 2400  
Rack travel mm : 13.80...13.90

##### Measurement

Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 7.20...7.50  
2nd pressure hPa : 270

F04

Rack travel in m: 7.40...7.50  
3rd pressure hPa : 1250  
Rack travel in m: 13.20...13.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 2400  
Speed rpm : 800  
Del. quantity cm3/ : 233.0...239.0  
1000 s: (231.0...241.0)  
Spread cm3 : 9.00  
1000 s: (13.0)  
Aneroid pressure h: 2400  
Speed rpm : 1000  
Del. quantity cm3/ : 240.0...248.0  
1000 s: (238.0...250.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 112.0...114.0  
1000 s: (109.0...117.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1335...1345

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.80...6.00  
Del. quantity cm3/ : 15.0...21.0  
1000 s: (13.0...23.0)  
Spread cm3 : 7.00  
1000 s: (11.00)

Remarks:

Start-of-delivery setting with ROBO  
diaphragm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF  
 Edition : 05.10.92  
 Replaces : 03.92  
 Test oil : ISO-4113

Combination no. : 0 402 646 968

Injection pump  
 Pump designation : PE6P120A32DRS7248  
 EP type number : 0 412 626 861  
 Governor  
 Governor design. : RQV275...1150PA986  
 Governor no. : 0 421 813 920

Customer-spec. information

Customer : DAF

Engine : RS 222 L

1st version kW : 222.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 120...140

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)

Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 11.7...12.7  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 12.20...12.30

---

Del. quantity cm<sup>3</sup>/ : 18.4...18.6  
 100 s: (18.1...18.9)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.3...1.9  
 100 s: (1.0...2.2)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 1.20...1.60

2nd speed rpm : 315  
 travel mm : 1.80...2.20

3rd speed rpm : 1205  
 travel mm : 8.10...8.50

4th speed rpm : 1340  
 travel mm : 9.70...9.90

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1325

Rack travel in mm : 9.90...12.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del. quantity : 184.0...186.0  
1000 : (181.0...189.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 175  
Minimum rack trave: 6.30  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 315...365

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 420  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 240  
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (117.0...125.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1190...1200

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF  
 Edition : 05.10.92  
 Replaces : 03.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 970  
 Injection pump  
 Pump designation : PE6P120A32ORS7248Y  
 EP type number : 0 412 626 863  
 Governor  
 Governor design. : R9V275...115CPA985  
 Governor no. : 0 421 813 920

Customer-spec. information  
 Customer : DAF

Engine : RS 180 L

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow quantity min. 1/h: 120...140  
 Test nozzle holder assembly : 1 688 901 105  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 089  
 Outside diameter x Wall thickness x Length mm : 8.00X2.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 14.00...15.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 10.2...11.2  
 Difference ° CS : 2.25...3.75

**BASIC SETTING**

1st speed rpm : 1000  
 Rack travel in mm : 10.70...10.80  
 Del. quantity cm<sup>3</sup>/ : 14.5...14.7  
 100 s: (14.2...15.0)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 275.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.3...1.9  
 100 s: (1.0...2.2)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**(B) Setting of injection pump with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 275  
 travel mm : 1.20...1.60  
 2nd speed rpm : 315  
 travel mm : 1.80...2.20  
 3rd speed rpm : 1205  
 travel mm : 8.10...8.50  
 4th speed rpm : 1340  
 travel mm : 9.70...9.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1340  
 Rack travel in mm : 8.40...11.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000  
Aneroid pressure h: 1000  
Del. quantity : 145.5...147.5  
1000 : (142.5...150.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 9.70  
Speed rpm : 1180...1190  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 175  
Minimum rack travel: 6.20  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 315...365

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 10.70...10.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 260  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 190  
Rack travel in m: 9.80...10.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600

Del. quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1180...1190

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : LIE  
 Edition : 25.09.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 982  
 Injection pump  
 Pump designation : PE6P120A320LS7848  
 EP type number : 0 412 626 866  
 Governor  
 Governor design. : RQV300...1050PA1034  
 Governor no. : 0 421 813 993

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 9306 TI

1st version kW : 270.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 3- 5- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 14.90...15.00

Del.quantity cm<sup>3</sup>/ : 25.9...26.1

100 s: (25.6...26.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.9

Del.quantity cm<sup>3</sup>/ : 3.0...3.6

100 s: (2.7...3.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.70...2.10

2nd speed rpm : 405  
 travel mm : 2.40...2.90

3rd speed rpm : 550  
 travel mm : 4.20...4.60

4th speed rpm : 780  
 travel mm : 6.30...6.90

5th speed rpm : 1118  
 travel mm : 10.40...10.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1185

Rack travel in mm : 12.60...15.20

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1050

Aneroid pressure h: 1500

Del.quantity : 259.0...261.0

1000 : (256.0...264.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 103...111

Testing:  
1st rack travel in: 13.90  
Speed rpm : 1100...1110  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 68...76

Testing:  
Speed rpm : 250  
Minimum rack travel: 8.90  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 350...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 700  
Pressure hPa : 1500  
Rack travel mm : 14.90...15.00

Measurement  
Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 950  
Rack travel in m: 14.60...14.70  
3rd pressure hPa : 750  
Rack travel in m: 13.00...13.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700

Del. quantity cm<sup>3</sup>/ : 194.0...196.0  
1000 s: (191.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 1100...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (146.0...174.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.90  
Del. quantity cm<sup>3</sup>/ : 30.0...36.0  
1000 s: (27.0...39.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (10.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
 Edition : 25.09.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : U 402 646 982A

Injection pump  
 Pump designation : PE6P120A320LS7848  
 EP type number : 0 412 626 866  
 Governor  
 Governor design. : RQV300...1050PA1034  
 Governor no. : 0 421 813 993

Cust. part no. : 9273581

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 9306 TI

1st version: kW : 270.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 3- 5- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

---

Rack travel in mm : 14.90...15.00

---

Del. quantity cm<sup>3</sup>/ : 25.9...26.1  
 100 s : (25.6...26.4)

Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.5...5.9  
 Del. quantity cm<sup>3</sup>/ : 3.0...3.6  
 100 s : (2.7...3.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.70...2.10  
 2nd speed rpm : 405  
 travel mm : 2.40...2.90  
 3rd speed rpm : 550  
 travel mm : 4.20...4.60  
 4th speed rpm : 780  
 travel mm : 6.30...6.90  
 5th speed rpm : 1118  
 travel mm : 10.40...10.60

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1185  
 Rack travel in mm : 12.60...15.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1500

Del.quantity : 259.0...261.0  
1000 : (256.0...264.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 103...111

#### Testing:

1st rack travel in: 13.90  
Speed rpm : 1100...1110  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 250  
Minimum rack travel: 8.90  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### CONSTANT REGULATION

Speed rpm : 350...420

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 700  
Pressure hPa : 1500  
Rack travel mm : 14.90...15.00

##### Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 950  
Rack travel in m: 14.60...14.70  
3rd pressure hPa : 750  
Rack travel in m: 13.00...13.20

#### START CUT-OUT

Speed 1/min : 100 (80)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 194.0...196.0  
1000 s: (191.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 1100...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (146.0...174.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.90  
Del.quantity cm<sup>3</sup>/ : 30.0...36.0  
1000 s: (27.0...39.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (10.00)

Remarks:

:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB  
 Edition : 05.10.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 993  
 Injection pump  
 Pump designation : PE6P120A320LS7852  
 EP type number : 0 412 626 871  
 Governor  
 Governor design. : RQ300/1050PA1030-3  
 Governor no. : 0 421 801 653

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 1100

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.90

Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 370...410

#### TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 800  
Rack travel in m: 14.40...14.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.30

#### Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 700  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 223.0...227.0  
1000 s: (220.0...230.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 45.0...75.0  
1000 s: (41.0...79.0)  
Rack travel in mm : 10.00...10.40

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB  
 Edition : 05.10.92  
 Replaces : 05.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 994  
 Injection pump  
 Pump designation : PE6P120A320LS7852  
 EP type number : 0 412 626 871  
 Governor  
 Governor design. : RQ300/950PA1032-3  
 Governor no. : 0 421 801 654

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA  
 1st version kW : 250.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x wall thickness  
 x length mm : 8.00x2.50x1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600  
 Rack travel in mm : 14.00...14.10  
 Del. quantity cm<sup>3</sup>/ : 23.4...23.6  
 100 s : (23.1...23.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.6...6.2  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s : (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1100  
 Del. quantity : 234.0...236.0  
 1000 : (231.0...239.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0  
 Testing:  
 1st rack travel in: 13.00

Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 200  
Minimum rack trave: 8.30  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.40

Measurement

Speed 1/min: 500

1st pressure hPa : 300  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 700  
Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 950  
Del.quantity cm3/ : 228.0...232.0  
1000 s: (225.0...235.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 50.0...80.0  
1000 s: (46.0...84.0)  
Rack travel in mm : 10.10...10.50

Remarks:

:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB  
 Edition : 05.10.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 646 996  
  
 Injection pump  
 Pump designation : PE6P120A320LS7852  
 EP type number : 0 412 626 871  
 Governor  
 Governor design. : RQ300/1050PA1031-4  
 Governor no. : 0 421 801 656

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1100

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.80  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.20  
2nd speed rpm : 1050  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 800  
Rack travel in m: 14.50...14.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.30

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 700  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1000  
Rack travel in m: 14.00...14.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 223.0...227.0  
1000 s: (220.0...230.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 255.0...275.0  
1000 s: (251.0...279.0)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB  
 Edition : 05.10.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 997  
 Injection pump  
 Pump designation : PE6P120A320LS7852  
 EP type number : 0 412 626 871  
 Governor  
 Governor design. : RQV300...950PA1033-5  
 Governor no. : 0 421 814 008

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 575  
 travel mm : 4.20...4.70

3rd speed rpm : 790  
 travel mm : 5.90...6.40

4th speed rpm : 1010  
 travel mm : 8.00...8.50

5th speed rpm : 1200  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1075

Rack travel in mm : 11.70...14.30

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1100

Del. quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 80...88

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 410...470

#### CONSTANT REGULATION

Speed rpm : 290...360

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 700  
Rack travel in m: 12.90...13.10  
3rd pressure hPa : 1100  
Rack travel in m: 14.00...14.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

F20

1st version  
Aneroid pressure h: 1100  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 228.0...232.0  
1000 s: (225.0...235.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 255.0...275.0  
1000 s: (251.0...279.0)

Remarks:

:



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB  
 Edition : 05.10.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 646 998  
  
 Injection pump  
 Pump designation : PE6P120A320LS7852  
 EP type number : 0 412 626 871  
 Governor  
 Governor design. : RQV300...1050PA1033  
 -6  
 Governor no. : 0 421 814 009

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del. quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.50...1.00

2nd speed rpm : 575  
travel mm : 4.30...4.80

3rd speed rpm : 625  
travel mm : 4.80...5.30

4th speed rpm : 830  
travel mm : 5.90...6.40

5th speed rpm : 1190  
travel mm : 9.80...10.30

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1100  
Del. quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 12.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 78...86

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.70  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00

#### CONSTANT REGULATION

Speed rpm : 300...400

#### TORQUE CONTROL

Dimension a mm : 0.20  
2nd speed rpm : 1050  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 700  
Rack travel in m: 12.80...13.00

3rd pressure hPa : 1100  
Rack travel in m: 14.00...14.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1050  
Del. quantity cm3/ : 223.0...227.0  
1000 s: (220.0...230.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1090...1105

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 z  
 Edition : 21.09.92  
 Replaces : 04.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 923  
 Injection pump  
 Pump designation : PE8P120A320LS7840-1  
 EP type number : 0 412 628 862  
 Governor  
 Governor design. : RQV350...1050PA866  
 -16  
 Governor no. : 0 421 813 961

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.40...13.60

Del. quantity cm<sup>3</sup>/ : 21.2...21.4

100 s : (20.9...21.7)

Spread cm<sup>3</sup> : 0.6

100 s : (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.4

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s : (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.30...1.80

2nd speed rpm : 454  
travel mm : 2.80...3.30

3rd speed rpm : 900  
travel mm : 5.40...5.90

4th speed rpm : 1107  
travel mm : 7.80...8.30

5th speed rpm : 1204  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 800  
Del. quantity : 212.0...214.0  
1000 : (209.0...217.0)  
Spread cm3 : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 66...74

Testing:

Speed rpm : 250  
Minimum rack trave: 7.60  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.80...13.00  
2nd speed rpm : 900  
Rack travel in m: 13.50...13.60  
3rd speed rpm : 800  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.40...13.60

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 550  
Rack travel in m: 12.40...12.60  
3rd pressure hPa : 1100  
Rack travel in m: 13.50...13.60 \*  
4th pressure hPa : 1200  
Rack travel in m: 13.80...14.00  
5th pressure hPa : -  
Rack travel in m: 10.60...10.90

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 1050  
Del. quantity cm3/ : 195.0...198.0  
1000 s: (192.0...201.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del. quantity cm3/ : 236.0...240.0  
1000 s: (233.0...243.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 e 1  
 Edition : 21.09.92  
 Replaces : 11.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 924

Injection pump  
 Pump designation : PE8P120A320LS7840-1  
 EP type number : 0 412 628 862  
 Governor  
 Governor design. : RGV350...950PA866-17  
 Governor no. : 0 421 813 962

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.40...13.60

Del. quantity cm<sup>3</sup>/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.4

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80

2nd speed rpm : 424  
 travel mm : 2.30...2.80

3rd speed rpm : 700  
 travel mm : 4.10...4.60

4th speed rpm : 1008  
 travel mm : 7.80...8.30

5th speed rpm : 1220  
 travel mm : 11.00...12.00

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 800  
Del. quantity : 212.0...214.0  
1000 : (209.0...217.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 11.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.10  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
Dimension a mm : 1.30  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 12.80...13.00  
2nd speed rpm : 850  
Rack travel in m: 13.80...13.90  
3rd speed rpm : 800  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.40...13.60

Measurement  
Speed 1/min : 600

1st pressure hPa : 300

F27

Rack travel in m: 11.10...11.30  
2nd pressure hPa : 550  
Rack travel in m: 12.40...12.60  
3rd pressure hPa : 1100  
Rack travel in m: 13.50...13.60 \*  
4th pressure hPa : 1200  
Rack travel in m: 13.80...14.00  
5th pressure hPa : -  
Rack travel in m: 10.60...10.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 195.0...198.0  
1000 s: (192.0...201.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 236.0...240.0  
1000 s: (233.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 937

Injection pump  
 Pump designation : PE8P120A320LS7840-10  
 EP type number : 0 412 628 856  
 Governor  
 Governor design. : RQV300...1050PA1033  
 -4

Governer no. : G 421 814 001

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

F28

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 Phasing : 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.30...13.40

Del. quantity cm<sup>3</sup>/ : 20.9...21.1

100 s : (20.6...21.4)

Spread cm<sup>3</sup> : 0.6

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s : (0.7...1.9)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.60...1.00

2nd speed rpm : 575  
 travel mm : 4.20...4.80

3rd speed rpm : 830  
 travel mm : 5.80...6.40

4th speed rpm : 1107  
 travel mm : 8.30...8.50

5th speed rpm : 1290  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1190

Rack travel in mm : 10.40...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700  
Aneroid pressure h : 1200  
Del. quantity : 209.0...211.0  
1000 : (206.0...214.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 79...87

#### Testing:

Speed rpm : 200  
Minimum rack travel: 9.40  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.70...12.90  
2nd speed rpm : 900  
Rack travel in m: 13.00...13.10  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 700

GD1

Rack travel in m: 12.60...12.80  
3rd pressure hPa : 1200  
Rack travel in m: 13.30...13.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 192.0...196.0  
1000 s: (189.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB  
 Edition : 05.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 938  
 Injection pump  
 Pump designation : PE8P120A320LS7840-10  
 EP type number : 0 412 628 856  
 Governor  
 Governor design. : RQ300/1050PA1030-2  
 Governor no. : 0 421 801 652

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x wall thickness  
 x length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 : 4- 1

Phasing : 0-45-90-135-180-225-  
 : 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 13.30...13.40  
 Del.quantity cm3/ : 20.9...21.1  
 : 100 s: (20.6...21.4)  
 Spread cm3 : 0.6  
 : 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.2...6.8  
 Del.quantity/ cm3/ : 1.0...1.6  
 : 100 s: (0.7...1.9)  
 Spread cm3 : 0.8  
 : 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 209.0...211.0  
 : 1000 : (206.0...214.0)  
 Spread cm3 : 6.00  
 : 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.70...12.90  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.30

#### Measurement

Speed 1/min : 500  
1st pressure hPa : 350  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 700  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 1200  
Rack travel in m: 13.30...13.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 192.0...196.0  
1000 s: (189.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 50.0...70.0  
1000 s: (46.0...74.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 945  
 Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQ300/1050PA1030-6  
 Governor no. : 0 421 801 666

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 211.0...213.0

1000 : (208.0...216.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 550  
Rack travel in m: 14.80...15.00

Aneroid/Altitude  
Compensator Test

1st. version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500  
1st pressure hPa : 350  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 700  
Rack travel in m: 12.20...12.40  
3rd pressure hPa : 1200  
Rack travel in m: 14.20...14.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 550  
Del.quantity cm3/ : 224.0...228.0  
1000 s: (221.0...231.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1090...1105

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 946  
 Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQ300/1050PA1031-7  
 Governor no. : 0 421 801 667

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050  


---

 Rack travel in mm : 13.90...14.00  


---

 Del.quantity cm3/ : 21.1...21.3  


---

 100 s: (20.8...21.6)

Spread cm3 : 0.6  


---

 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1200  
 Del.quantity : 211.0...213.0  
 1000 : (208.0...216.0)  
 Spread cm3 : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.90...14.10  
2nd speed rpm : 550  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500  
1st pressure hPa : 350  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 700  
Rack travel in m: 12.20...12.40  
3rd pressure hPa : 1200  
Rack travel in m: 14.20...14.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200

G07

Speed rpm : 550  
Del.quantity cm3/ : 224.0...228.0  
1000 s: (221.0...231.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1090...1105

Remarks:

APPLICATION

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 947  
 Injection pump  
 Pump designation : PE8P120A320LS7859  
 EP type number : 0 412 628 869  
 Governor  
 Governor design. : RQ300/950PA1032-5  
 Governor no. : 0 421 801 668

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 950

Rack travel in mm : 14.10...14.20

Del.quantity cm<sup>3</sup>/ : 23.1...23.3

100 s: (22.8...23.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 950

Aneroid pressure h: 1000

Del.quantity : 231.0...233.0

1000 : (228.0...236.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.10  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 600  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 14.10...14.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 550  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 142.0...144.0  
1000 s: (139.0...147.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 990...1005

Remarks:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 948  
 Injection pump  
 Pump designation : PE8P120A320LS7859  
 EP type number : 0 412 628 869  
 Governor  
 Governor design. : RQ300/1050PA1030-7  
 Governor no. : 0 421 801 669

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 22.3...22.5

100 s: (22.0...22.8)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1050

Aneroid pressure h: 1000

Del.quantity : 223.0...225.0

1000 : (220.0...228.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 500  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...11.00

Measurement

Speed 1/min : 500  
1st pressure hPa : 250  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 600  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 14.10...14.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 243.0...247.0  
1000 s: (240.0...250.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 139.0...141.0  
1000 s: (136.0...143.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1090...1105

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 21,6 c  
 Edition : 21.09.92  
 Replaces : 11.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 670 808  
 Injection pump  
 Pump designation : PE12P120A520/5RS7212  
 EP type number : 0 412 620 823  
 Governor  
 Governor design. : RSUV325...1150POA359  
 Governor no. : 0 421 829 108

Customer-spec. information  
 Customer : MWM

Engine : TBD234V12

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.60...4.70  
 : (4.55...4.75)  
 Rack travel in mm : 9.00...12.00

G12

Firing order : 1- 2- 9- 10- 5- 6-  
 11- 12- 3- 4- 7- 8

Phasing : 0-30-60-90-120-150-  
 180-210-240-270-300-  
 330

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 13.40...13.50  
 Del. quantity cm<sup>3</sup>/ : 26.0...26.2  
 100 s : (25.8...26.6)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 6.9...7.1  
 Del. quantity cm<sup>3</sup>/ : 3.0...4.0  
 100 s : (2.7...4.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

RATED SPEED

1st version  
 Control lever  
 position degrees: 106...114  
 Testing:  
 1st rack travel in: 12.40  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1260...1290  
 4th rack travel in: 1440  
 Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
 position degrees: 71...79  
 Setting point w/out bumper spring  
 Speed rpm : 325  
 Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 440...500

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1250  
Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 625  
Rack travel in m: 12.00...12.10

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 330.0...370.0  
1000 s: (-)

HIGH IDLE

1st version

Speed rpm : 325  
Rack travel in mm : 9.20...9.40  
Del.quantity cm3/ : 85.0...105.0  
1000 s: (-)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.90...8.10  
Del.quantity cm3/ : 0 \*  
1000 s: (-)

Remarks:

:

\* = Element disconnected at idle for cylinders 2, 4, 6, 8, 10 and 12.

Hydraulic latching of starting delivery.

Latching at 0.75 bar...0.85 bar.

Unlatching at 0.35 bar...0.45 bar.

Full-load delivery not known. Set according to engine test report.

Test specifications upon request.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 t  
 Edition : 21.09.92  
 Replaces : 12.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 676 811  
 Injection pump  
 Pump designation : PE6P120A320LS7834-1  
 EP type number : 0 412 626 857  
 Governor  
 Governor design. : RSV675...1050POA826  
 -2  
 Governor no. : 0 421 833 366

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 401 LA

1st version kW : 205.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 14.10...14.20

Del. quantity cm<sup>3</sup>/ : 22.1...22.3

100 s: (21.8...22.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 675.0

Rack travel in mm : 4.2...4.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Del. quantity : 221.0...223.0

1000 : (218.0...225.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 85...93

Testing:

1st rack travel in: 13.10  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1100...1118  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 675  
Rack travel in mm : 4.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 675  
Rack travel in mm : 4.00...4.60  
Rack travel in mm : 2.00  
Speed rpm : 680...720

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 214.0...218.0  
1000 s: (211.0...221.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

LOW IDLE

Speed rpm : 675  
Rack travel in mm : 4.20...4.60

Del. quantity cm<sup>3</sup>/ : 16.0...22.0  
1000 s: (13.0...25.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (10.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 w 2  
 Edition : 21.09.92  
 Replaces : 05.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 811  
 Injection pump  
 Pump designation : PES6P110A12DRS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964  
 -3K  
 Governor no. : 0 421 815 255

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 147.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del. quantity cm<sup>3</sup>/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.60...1.80

2nd speed rpm : 600

travel mm : 2.80...3.30

3rd speed rpm : 1300

travel mm : 7.20...7.40

4th speed rpm : 1500

travel mm : 8.90...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del. quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 13.80

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1460...1490

4th rack travel in: 1600

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

Speed rpm : 275

Minimum rack travel: 7.20

Speed rpm : 400

Rack travel in mm : 5.50...5.70

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 14.80...14.90

2nd speed rpm : 800

Rack travel in m: 13.20...13.40

## Aneroid/Altitude

### Compensator Test

1st version

Setting

Speed rpm : 1250

Pressure hPa : 1200

Rack travel mm : 14.80...14.90

## Measurement

Speed 1/min : 1250

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 410

Rack travel in m: 10.60...10.70

3rd pressure hPa : 755

Rack travel in m: 13.70...14.10

## START CUT-OUT

Speed 1/min : 290 (300)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 800

Del. quantity cm<sup>3</sup>/ : 156.5...162.5

1000 s: (153.5...165.5)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 90.0...94.0

1000 s: (88.0...96.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80

Speed rpm : 1290...1300

## STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 11.90...12.90

## LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.50...5.70

Del. quantity cm<sup>3</sup>/ : 32.0...38.0

1000 s: (30.0...40.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.00)

Remarks:

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 12,0 c3  
 Edition : 08.10.92  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 876  
 Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...850PA929-3K  
 Governor no. : 0 421 815 232

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-300 4VH

1st version kW : 220.0  
 Rated speed : 1750

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850  
 Rack travel in mm : 12.20...12.30  
 Del.quantity cm<sup>3</sup>/ : 20.4...20.6  
 100 s: (20.2...20.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 650  
 travel mm : 5.60...5.80  
 4th speed rpm : 900  
 travel mm : 8.30...8.50  
 5th speed rpm : 1100  
 travel mm : 10.30...10.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1200  
 Del.quantity : 204.0...206.0  
 1000 : (202.0...208.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 11.20  
Speed rpm : 890...900  
2nd rack travel in: 4.00  
Speed rpm : 1040...1070  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 600  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 12.50...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 265  
Rack travel in m: 9.00...9.10  
3rd pressure hPa : 565  
Rack travel in m: 11.20...11.60

## START CUT-OUT

Speed 1/min : 275 (285)

G19

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 241.0...247.0  
1000 s: (239.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 148.0...152.0  
1000 s: (146.0...154.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 890...900

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.00...10.60

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5185-P16

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 h  
Edition : 21.09.92  
Replaces : 04.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 883  
  
Injection pump  
Pump designation : PES6P110A32ORS7198  
EP type number : 0 412 716 802  
Governor  
Governor design. : RQV275...1250PA942K  
Governor no. : 0 421 815 234

Customer-spec. information  
Customer : RVI

Engine : MIDR06-06-26

1st version kW : 132.5  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 419 992 198  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test lines : 1 680 750 089  
  
Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 4.60...4.70  
                  : (4.55...4.75)  
Rack travel in mm : 12.50...13.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.10...15.10  
& maximum rack tra: 20.0...21.0  
Difference ° CS : 2.50...4.00

## BASIC SETTING

1st speed rpm : 1250  

---

Rack travel in mm : 14.60...14.70  

---

Del. quantity cm<sup>3</sup>/ : 15.7...15.9  
100 s: (15.4...16.1)  

---

Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

2nd speed rpm : 275.0  
Rack travel in mm : 5.3...5.7  
Del. quantity cm<sup>3</sup>/ : 1.7...2.2  
100 s: (1.4...2.4)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300  
travel mm : 9.50...9.70  
2nd speed rpm : 275  
travel mm : 0.90...1.10  
3rd speed rpm : 550  
travel mm : 3.80...4.20  
4th speed rpm : 1000  
travel mm : 7.10...7.50  
5th speed rpm : 1600  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1385  
Rack travel in mm : 12.30...14.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1000  
Del. quantity : 157.0...159.0  
1000 : (154.5...161.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.60  
Speed rpm : 1315...1325  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 275  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 350...480

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 750  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 300  
Rack travel in m: 12.90...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.70

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 11.00...11.40

2nd pressure hPa : 360  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 220  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (122.0...132.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 67.0...69.0  
1000 s: (64.5...71.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 1315...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 85.0...115.0  
1000 s: (81.0...119.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.30  
Del. quantity cm<sup>3</sup>/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE  
 Edition : 26.06.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 932A  
 Injection pump  
 Pump designation : PES6P120A720RS7258  
 EP type number : 0 412 726 862  
 Governor  
 Governor design. : RQV300...1050PA1035  
 Governor no. : 0 421 813 995

Cust. part no. : 9274017

Customer-spec. information  
 Customer : LIEBHERR

Engine : D926Ti

1st version kW : 220.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

G22

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.40...13.50

Del. quantity cm<sup>3</sup>/ : 20.7...20.9

100 s : (20.4...21.2)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.5...7.1  
 Del. quantity cm<sup>3</sup>/ : 3.0...3.6  
 100 s : (2.7...3.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.70...2.20  
 2nd speed rpm : 490  
 travel mm : 3.30...3.80  
 3rd speed rpm : 780  
 travel mm : 6.30...6.80  
 4th speed rpm : 1120  
 travel mm : 10.30...10.80  
 5th speed rpm : 1320  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 11.50...14.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1500

Del. quantity : 207.0...209.0  
1000 : (204.0...212.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

#### Testing:

1st rack travel in: 12.50  
Speed rpm : 1100...1110  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1390  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 250  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in min : 6.70...6.90  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### CONSTANT REGULATION

Speed rpm : 350...450

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 700  
Pressure hPa : 1500  
Rack travel mm : 13.40...13.50

##### Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 1050  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 720  
Rack travel in m: 11.20...11.40

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm3/ : 154.0...156.0  
1000 s : (151.0...159.0)  
Spread cm3 : 8.00  
1000 s : (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1100...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 175.0...195.0  
1000 s : (171.0...199.0)

#### Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER
Edition : 05.10.92
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 746 934
Injection pump
Pump designation : PES6P120A32ORS7256
EP type number : 0 412 726 879
Governor
Governor design. : RQV250...950PA793-3
Governor no. : 0 421 814 014

Customer-spec. information
Customer : PERKINS

Engine : EAGLE TX 375/400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder
assembly : 1 688 901 019
Opening
pressure, bar : 207...210
Orifice plate
diameter mm : 0,8
Test lines : 1 680 750 075
Outside diameter
x Wall thickness
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 4.50...4.60
: (4.45...4.65)
Rack travel in mm : 12.00...13.00

Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
Rack travel in mm : 12.20...12.30
Del.quantity cm³/ : 26.2...26.4
100 s: (25.9...26.7)
Spread cm³ : 0.6
100 s: (0.9)
2nd speed rpm : 250.0
Rack travel in mm : 5.9...6.1
Del.quantity cm³/ : 1.3...1.7
100 s: (1.0...2.0)
Spread cm³ : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.90...1.40
2nd speed rpm : 315
travel mm : 1.70...2.20
3rd speed rpm : 670
travel mm : 3.90...4.40
4th speed rpm : 985
travel mm : 7.60...7.80
5th speed rpm : 1250
travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1115
Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 900
Aneroid pressure h: 1200
Del.quantity : 262.0...264.0
1000 : (259.0...267.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.30  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 8.20...8.40  
2nd pressure hPa : 515  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 300  
Rack travel in m: 9.10...9.30

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 142.0...144.0  
1000 s: (139.0...147.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 193.0...230.0  
1000 s: (187.0...233.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB  
 Edition : 05.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 936  
 Injection pump  
 Pump designation : PES6P120A720LS7238  
 -10  
 EP type number : 0 412 726 873  
 Governor  
 Governor design. : RQ300/1100PA1044  
 Governor no. : 0 421 801 670

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 hLA

1st version kW : 220.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 14.50...14.60

Del.quantity cm<sup>3</sup>/ : 22.0...22.2

100 s: (21.7...22.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 220.0...222.0

1000 : (217.0...225.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.50  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 9.20  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 550  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.20

Measurement

Speed 1/min : 500  
1st pressure hPa : 200  
Rack travel in m: 11.70...11.80  
2nd pressure hPa : 550  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1000  
Rack travel in m: 14.70...14.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 550  
Del. quantity cm<sup>3</sup>/ : 237.0...241.0  
1000 s: (234.0...244.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 142.0...144.0  
1000 s: (139.0...147.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1145...1160

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC  
 Edition : 21.09.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 748 807  
 Injection pump  
 Pump designation : PES8P120A920/4LS7246  
 EP type number : 0 412 728 805  
 Governor  
 Governor design. : RQV325...1000PA1018  
 -1K  
 Governor no. : 0 421 815 292

Customer-spec. information  
 Customer : MACK

Engine : EE9 530

1st version kW : 395.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 12.00...14.00  
 Firing order : 1- 2- 7- 8- 4- 5-  
 6- 3

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 13.60...13.70

Del. quantity cm<sup>3</sup>/ : 29.3...29.5

100 s : (29.0...29.8)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

2nd speed rpm : 325.0

Rack travel in mm : 5.6...5.8

Del. quantity cm<sup>3</sup>/ : 2.4...3.0

100 s : (2.1...3.3)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.30...1.60

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 900  
 travel mm : 7.50...7.90

4th speed rpm : 1050  
 travel mm : 8.90...9.10

5th speed rpm : 1300  
 travel mm : 11.50...11.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1240

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500  
Aneroid pressure h: 1200  
Del.quantity : 293.0...295.0  
1000 : (290.0...298.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

RATED SPEED

1st version

Control lever  
position degrees: 62...70

Testing:

1st rack travel in: 15.30  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1235...1265  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 10...18

Testing:

Speed rpm : 275  
Minimum rack travel: 1.00  
Speed rpm : 325  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 325...600

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 500  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 1000  
Rack travel in m: 16.30...16.50  
3rd speed rpm : 700  
Rack travel in m: 14.10...14.50  
4th speed rpm : 400  
Rack travel in m: 13.20...13.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 16.30...16.50

Measurement

HD1

Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 235  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 610  
Rack travel in m: 14.40...14.80

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 306.5...312.5  
1000 s: (305.5...315.5)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 184.5...188.5  
1000 s: (181.5...191.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.30  
Speed rpm : 1055...1065

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (156.0...204.0)  
Rack travel in mm : 11.00...12.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 24.0...30.0  
1000 s: (21.0...33.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.08.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 246 033  
 Injection pump  
 Pump designation : PES6MW100/72ORS1511  
 EP type number : 0 413 206 011  
 Governor  
 Governor design. : RQV300...1300MW125-6  
 Governor no. : 0 420 083 286

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM366LA

1st version kW : 156.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 089  
 Outside diameter  
 x wall thickness  
 x length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 21.00...0.00

H03

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 12.60...12.70  
 Del. quantity cm<sup>3</sup>/ : 11.8...12.0  
 100 s: (11.6...12.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.1...4.3  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 8.60...9.00  
 2nd speed rpm : 880  
 travel mm : 4.90...5.10  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1400  
 Del. quantity : 118.0...120.0  
 1000 : (116.0...122.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 118...126

Testing:  
 1st rack travel in: 11.60

Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 61...69

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 6.60...6.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 7.20...7.40  
2nd pressure hPa : 900  
Rack travel in m: 11.90...12.10  
3rd pressure hPa : 1400  
Rack travel in m: 12.60...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm3/ : 111.5...114.5  
1000 s: (109.0...117.0)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 35.0...37.0  
1000 s: (33.0...39.0)

BREAKAWAY

1st version

H04

1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.10...4.30  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: :

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 436 114  
 Injection pump  
 Pump designation : PES6MW100/320/3RS119  
 4-1  
 EP type number : 0 413 406 221  
 Governor  
 Governor design. : RQV300...1300MW108K  
 Governor no. : 0 420 083 998

Customer-spec. information  
 Customer : PERKINS

Engine : 180 TI

1st version kW : 134.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0.6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

H05

Prestroke mm : 3.30...3.40  
 : (3.25...3.45)  
 Rack travel in mm : 12.00...14.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.30...14.40

Del. quantity cm<sup>3</sup>/ : 13.4...13.6

100 s: (13.2...13.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del. quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 10.00...10.40

2nd speed rpm : 900  
 travel mm : 6.40...6.60

3rd speed rpm : 480  
 travel mm : 3.10...3.70

4th speed rpm : 300  
 travel mm : 1.40...1.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900



Del. quantity : 134.0...136.0  
1000 : (132.0...138.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 13.30  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

#### CONSTANT REGULATION

Speed rpm : 330...500

#### TORQUE CONTROL

Dimension a mm : 2.60  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 800  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 500  
Rack travel in m: 11.70...11.90  
4th speed rpm : 1000  
Rack travel in m: 13.60...13.90  
5th speed rpm : 700  
Rack travel in m: 12.60...12.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.20...9.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : 180

H06

Rack travel in m: 10.40...10.50  
2nd pressure hPa : 220  
Rack travel in m: 10.90...11.20  
3rd pressure hPa : 900  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 240 (250)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 126.0...129.0  
1000 s: (123.5...131.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)  
Aneroid pressure h: 900  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 107.5...110.5  
1000 s: (105.0...113.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 61.0...63.0  
1000 s: (59.0...65.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 78.0...92.0  
1000 s: (75.0...95.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del. quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
Edition : 21.08.92
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 444 113A
Injection pump
Pump designation : PES4MW100/72ORS1151
EP type number : 0 413 404 104
Governor
Governor design. : RQV300...1300MW50-3
Governor no. : 0 420 083 129

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM 364 LA

1st version kW : 85.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.70...10.80

Del. quantity cm3/ : 8.0...8.2

100 s : (7.8...8.4)

Spread cm3 : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...6.9

Del. quantity cm3/ : 1.0...1.4

100 s : (0.7...1.6)

Spread cm3 : 0.3

100 s : (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1340
travel mm : 8.50...8.70

2nd speed rpm : 1450
travel mm : 9.50...9.90

3rd speed rpm : 500
travel mm : 2.70...3.30

4th speed rpm : 300
travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del. quantity : 80.0...82.0

1000 : (78.0...84.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...6.90

CONSTANT REGULATION  
Speed rpm : 320...550

TORQUE CONTROL  
Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 750  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 1175  
Rack travel in m: 11.00...11.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 75.5...78.5  
1000 s: (73.0...81.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...6.90  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.08.92  
 Replaces : 06.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 139  
 Injection pump  
 Pump designation : PES4MW100/72ORS1151  
 EP type number : 0 413 404 104  
 Governor  
 Governor design. : RQV300...1300MW67-7  
 Governor no. : 0 420 083 278

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM364A

1st version kw : 79.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

H09

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 10.80...10.90  
 Del. quantity cm<sup>3</sup>/ : 8.2...8.4  
 100 s : (8.0...8.6)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.5  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s : (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 8.40...8.80  
 2nd speed rpm : 880  
 travel mm : 4.90...5.10  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del. quantity : 82.0...84.0  
 1000 : (80.0...86.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Setting point:  
Speed rpm : 1350  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 480...540

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1000  
Rack travel in m: 11.60...11.70  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Rack travel mm : 9.70...9.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

START CUT-OUT

H10

Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : IHC  
 Edition : 21.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 239AA  
 Injection pump  
 Pump designation : PES6MW100/32ORS1189  
 EF type number : 0 413 406 177  
 Governor  
 Governor design. : RQV350...1200MW46-21  
 Governor no. : 0 420 083 201

Cust. part no. : 1819901C91

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kw : 186.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

H11

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : ?

**BASIC SETTING**

1st speed rpm : 1200  
 Rack travel in mm : 12.50...12.60  
 Del. quantity cm<sup>3</sup>/ : 13.0...13.4  
 100 s : (12.8...13.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s : (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20  
 2nd speed rpm : 1250  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del. quantity : 130.0...134.0  
 1000 : (128.0...136.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1400...1410  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.00...9.10

Measurement  
Speed 1/min : 500

1st pressure hPa : 335  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 645  
Rack travel in m: 11.40...11.80  
3rd pressure hPa : 1200  
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 133.5...135.5  
1000 s: (131.5...137.5)  
Spread cm<sup>3</sup> : 6.50  
1000 s: (7.00)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 68.0...70.0  
1000 s: (66.0...72.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...190.0  
1000 s: (147.0...193.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC  
 Edition : 21.08.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 254BA  
 Injection pump  
 Pump designation : PES6MM100/320RS1189  
 EP type number : 0 413 406 177  
 Governor  
 Governor design. : RQV350...1200MW46-29  
 Governor no. : 0 420 083 217

Cust. part no. : 1819902C91

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

H13

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200  
 Rack travel in mm : 12.50...12.60  
 Del. quantity cm<sup>3</sup>/ : 13.0...13.4  
 100 s: (12.8...13.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20  
 2nd speed rpm : 1250  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del. quantity : 130.0...134.0  
 1000 : (128.0...136.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**



1st version  
Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1400...1410  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350

CONSTANT REGULATION  
Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.00...9.10

Measurement  
Speed 1/min : 500

1st pressure hPa : 335  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 645  
Rack travel in m: 11.40...11.80  
3rd pressure hPa : 1200  
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 133.5...135.5  
1000 s: (131.5...137.5)

Spread cm<sup>3</sup> : 6.50  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 68.0...70.0  
1000 s: (66.0...72.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 150.0...190.0  
1000 s: (147.0...193.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del. quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Edition : 21.08.92  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 271  
 Injection pump  
 Pump designation : PES6MW100/720RS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQV300...1300MW50-11  
 Governor no. : 0 420 083 235

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 129.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.4...8.6

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.10...9.50

2nd speed rpm : 1345

travel mm : 8.20...8.40

3rd speed rpm : 500

travel mm : 3.80...4.40

4th speed rpm : 300

travel mm : 1.10...1.50

5th speed rpm : -

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Setting point:  
Speed rpm : 1350  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 300  
Rack travel in mm : 8.40...8.60

CONSTANT REGULATION  
Speed rpm : 330...500

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 600  
Rack travel in m: 12.20...12.30  
3rd speed rpm : 900  
Rack travel in m: 11.80...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 225  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 325  
Rack travel in m: 11.90...12.10  
3rd pressure hPa : 900

Rack travel in m: 12.20...12.30

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 67.0...70.0  
1000 s: (64.5...72.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 37.0...39.0  
1000 s: (35.0...41.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.40...8.60  
Del. quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Edition : 21.08.92
Replaces : 02.91
Test oil : ISO-4113
Combination no. : 0 403 446 274
Injection pump
Pump designation : PES6MW100/72ORS1131
EP type number : 0 413 406 123
Governor
Governor design. : RQ300/1300MW105-10
Governor no. : 0 420 082 062

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kW : 121.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test Lines : 1 680 715 089

Outside diameter
x Wall thickness
x Length mm : 8.00x2.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.75)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300
Rack travel in mm : 10.90...11.00
Del.quantity cm3/ : 8.8...9.0
100 s: (8.6...9.2)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 6.1...6.3
Del.quantity cm3/ : 1.0...1.4
100 s: (0.7...1.6)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -2
Speed rpm : 1200
Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1300
Aneroid pressure h: 700
Del.quantity : 88.0...90.0
1000 : (86.0...92.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Setting point:
Speed rpm : 1200
Rack travel in mm : 15.5

Testing:
1st rack travel in: 9.90
Speed rpm : 1345...1360
2nd rack travel in: 4.00
Speed rpm : 1410...1440
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 510...550

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 750  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1100  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...9.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 400  
Rack travel in m: 11.10...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Edition : 21.08.92  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 278  
 Injection pump  
 Pump designation : PES6MM100/72ORS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RQV300...1300MW50-17  
 Governor no. : 0 420 083 244

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kw : 150.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 089  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 12.20...12.30  
 Del. quantity cm<sup>3</sup>/ : 9.6...9.8  
 100 s : (9.4...10.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.1...6.3  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s : (0.7...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1500  
 travel mm : 9.80...10.20  
 2nd speed rpm : 1350  
 travel mm : 8.40...8.60  
 3rd speed rpm : 670  
 travel mm : 4.60...5.20  
 4th speed rpm : 300  
 travel mm : 1.10...1.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1370  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del. quantity : 96.5...98.5  
 1000 : (94.5...100.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 107...115

Setting point:  
Speed rpm : 1370  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 55...63  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00

CONSTANT REGULATION  
Speed rpm : 350...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 170  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 225  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 700  
Rack travel in m: 12.20...12.30

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

H2O

Aneroid pressure h: 700  
Speed rpm : 575  
Del.quantity cm3/ : 82.0...85.0  
1000 s: (79.5...87.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 50.5...52.5  
1000 s: (48.5...54.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...100.0  
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 6,2 F  
Edition : 21.08.92  
Replaces : 04.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 292  
  
Injection pump  
Pump designation : PES6MW100/720RS1131-  
1  
EP type number : 0 413 406 165  
Governor  
Governor design. : RQV300...1300MW123  
Governor no. : 0 420 085 255

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM366LA

1st version kW : 170.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup>/ : 11.4...11.6

100 s : (11.2...11.8)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s : (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...9.80

2nd speed rpm : 1350

travel mm : 8.40...8.60

3rd speed rpm : 600

travel mm : 3.70...4.30

4th speed rpm : 300

travel mm : 0.80...1.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 110...118

Setting point:  
Speed rpm : 1350  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 440...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 400  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

H22

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MWM 6,2 F  
 Edition : 21.08.92  
 Replaces : 04.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 294  
 Injection pump  
 Pump designation : PES6PW100/72ORS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV350...1100MW67-4  
 Governor no. : 0 420 083 261

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM366LA

1st version kW : 162.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 089  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1100  
 Rack travel in mm : 13.60...13.70  
 Del. quantity cm<sup>3</sup>/ : 11.2...11.4  
 100 s: (11.0...11.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.6...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1150  
 travel mm : 7.70...8.10  
 2nd speed rpm : 900  
 travel mm : 5.80...6.00  
 3rd speed rpm : 500  
 travel mm : 2.50...3.10  
 4th speed rpm : 350  
 travel mm : 1.20...1.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1000  
 Del. quantity : 112.0...114.0  
 1000 : (110.0...116.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 120...128

Setting point:  
Speed rpm : 1150  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 12.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.50

Measurement  
Speed 1/min : 500

1st pressure hPa : 400  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 600  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 1000  
Rack travel in m: 13.60...13.80

START CUT-OUT

Speed 1/min : 250 (270)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600

H24

Del.quantity cm3/ : 104.5...107.5  
1000 s: (102.0...110.0)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 35.0...37.0  
1000 s: (33.0...39.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 F
Edition : 21.08.92
Replaces : MWM 6,2
Test oil : ISO-4113
Combination no. : 0 403 446 295
Injection pump
Pump designation : PES6MW100/72ORS1131-1
EP type number : 0 413 406 165
Governor
Governor design. : RQV300...1300MW67-5
Governor no. : 0 420 083 262

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : GM 366 LA

1st version kW : 155.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
assembly : C 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
Prestroke mm : 3.60...3.70
: (3.55...3.75)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300
Rack travel in mm : 13.10...13.20
Del. quantity cm3/ : 9.8...10.0
100 s: (9.6...10.2)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 6.1...6.3
Del. quantity cm3/ : 0.9...1.3
100 s: (0.6...1.5)
Spread cm3 : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350
travel mm : 8.40...8.80
2nd speed rpm : 880
travel mm : 4.90...5.10
3rd speed rpm : 500
travel mm : 2.70...3.30
4th speed rpm : 300
travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1350
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1300
Aneroid pressure h: 1000
Del. quantity : 98.0...100.0
1000 : (96.0...102.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 116...124

Setting point:  
Speed rpm : 1350  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 350  
Rack travel in m: 12.10...12.40  
3rd pressure hPa : 1000  
Rack travel in m: 13.10...13.20

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 85.0...88.0  
1000 s: (82.5...90.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 35.0...37.0  
1000 s: (33.0...39.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 F  
 Edition : 21.08.92  
 Replaces : 04.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 306  
 Injection pump  
 Pump designation : PES6MW100/720RS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RQV300...1300MW67-6  
 Governor no. : 0 420 083 274

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kW : 121.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 715 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 8.8...9.0  
 100 s : (8.6...9.2)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s : (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.50...9.90  
 2nd speed rpm : 1350  
 travel mm : 8.60...8.80  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 88.0...90.0  
 1000 : (86.0...92.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Setting point:  
Speed rpm : 1350  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1550  
Speed rpm : 0.0...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 850  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 1100  
Rack travel in m: 10.70...10.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.20...9.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 400  
Rack travel in m: 10.50...10.70  
3rd pressure hPa : 700  
Rack travel in m: 11.20...11.40

START CUT-OUT

H28

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 80.0...90.0  
1000 s: (77.0...93.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 F  
 Edition : 21.09.92  
 Replaces : MWM 6,2  
 Test oil : ISO-4113

Combination no. : 0 403 446 309

Injection pump  
 Pump designation : PES6MW100/32ORS1227  
 EP type number : 0 413 406 215  
 Governor  
 Governor design. : RQV325...1300MW126  
 Governor no. : 0 420 083 279

Cust. part no. : 1249951

Customer-spec. information  
 Customer : DAF

Engine : NS156L

1st version kW : 156.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

J01

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 13.50...0.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000  


---

 Rack travel in mm : 13.10...13.20  


---

 Del. quantity cm<sup>3</sup>/ : 10.8...11.0  
 100 s: (10.6...11.2)  


---

 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.4...4.6  
 Del. quantity cm<sup>3</sup>/ : 0.7...1.1  
 100 s: (0.4...1.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 8.40...8.80  
 2nd speed rpm : 875  
 travel mm : 4.90...5.10  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 325  
 travel mm : 1.50...1.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1000  
 Del. quantity : 108.5...110.5  
 1000 : (106.5...112.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version



Control lever  
position degrees: 119...127

Testing:

1st rack travel in: 12.10  
Speed rpm : 1330...1340  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:

Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 325  
Rack travel in mm : 4.40...4.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.10...13.20

Measurement

Speed 1/min : 600

1st pressure hPa : 500  
Rack travel in m: 12.50...12.60  
2nd pressure hPa : 290  
Rack travel in m: 11.10...11.40  
3rd pressure hPa : -  
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 103.0...106.0  
1000 s: (100.5...108.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 63.0...65.0  
1000 s: (61.0...67.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1330...1340

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.40...4.60  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MWM 6,2 F  
 Edition : 21.09.92  
 Replaces : 04.92  
 Test oil : ISO-4113

Combination no. : 0 403 456 120

Injection pump  
 Pump designation : PES6MW100/321RS1210  
 EP type number : 0 413 406 201  
 Governor  
 Governor design. : RQ250/1050MW84-11  
 Governor no. : 0 420 082 066

Cust. part no. : 3-7220

Customer spec. information  
 Customer : MAN

Engine : D 0826 LUH 06

1st version kW : 184.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 800

---

Rack travel in mm : 14.00...14.10

---

Del. quantity cm<sup>3</sup>/ : 16.1...16.3  
 100 s: (15.8...16.6)

---

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 250.0  
 Rack travel in mm : 5.0...5.2  
 Del. quantity cm<sup>3</sup>/ : 1.3...1.7  
 100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 1100  
 Del. quantity : 161.0...163.0  
 1000 : (158.0...166.0)

Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 13.00

Speed rpm : 1075...1090  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 600  
Rack travel in m: 14.00...14.10  
3rd speed rpm : 1050  
Rack travel in m: 14.00...14.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 700  
Rack travel in m: 13.20...13.50  
3rd pressure hPa : 1100  
Rack travel in m: 14.00...14.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 161.0...165.0  
1000 s: (158.0...168.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1100  
Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 155.0...159.0  
1000 s: (152.0...162.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 67.0...69.0  
1000 s: (65.0...71.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1075...1090

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 F  
 Edition : 21.09.92  
 Replaces : 04.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 121  
 Injection pump  
 Pump designation : PES6MM100/321RS1186  
 EP type number : 0 413 406 168  
 Governor  
 Governor design. : RQ250/1200MM84-12  
 Governor no. : 0 420 082 067

Cust. part no. : 3-7221

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LUH03

1st version kW : 157.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 15.00...0.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.80...14.90

Del.quantity cm<sup>3</sup>/ : 12.6...12.8

100 s : (12.4...13.0)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.9...2.3

100 s : (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 126.0...128.0

1000 : (124.0...130.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 15.5

Testing:

1st rack travel in: 13.30

Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1400  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 600  
Rack travel in m: 14.80...14.90  
3rd speed rpm : 1000  
Rack travel in m: 14.50...14.70  
4th speed rpm : 1200  
Rack travel in m: 14.30...14.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 12.30...12.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 12.70...12.80  
2nd pressure hPa : 400  
Rack travel in m: 13.80...14.10  
3rd pressure hPa : 1000  
Rack travel in m: 14.80...14.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 126.0...130.0  
1000 s: (123.0...133.0)

Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 126.0...130.0  
1000 s: (123.0...133.0)  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 122.0...126.0  
1000 s: (119.0...129.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a 5  
 Edition : 21.09.92  
 Replaces : 07.87  
 Test oil : ISO-4113

Combination no. : 9 400 083 454

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...900A7C2209-1R

Governer no. : 9 420 083 232

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 12.9...13.0

100 s: (12.7...13.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.4...2.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 129.0...130.0

1000 : (127.0...132.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Testing:

1st rack travel in: 11.70  
Speed rpm : 943...948  
2nd rack travel in: 4.00  
Speed rpm : 977...986  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 415...475

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 550  
Rack travel in m: 12.70...12.90  
5th speed rpm : 400  
Rack travel in m: 14.00...14.60

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 943...948

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

#### APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 454DF  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...900A7C2209-1R  
 Governor no. : 9 420 083 232

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 11.10...11.20  
 Del.quantity cm<sup>3</sup>/ : 10.1...10.2  
 100 s: (9.9...10.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.4...2.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Del.quantity : 101.0...102.0  
 1000 : (99.0...104.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 103...111

Testing:



1st rack travel in: 10.10  
Speed rpm : 943...948  
2nd rack travel in: 4.00  
Speed rpm : 970...979  
4th rack travel in: 1150  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 415...475

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 550  
Rack travel in m: 11.10...11.30  
5th speed rpm : 400  
Rack travel in m: 12.30...12.90

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 943...948

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 21.09.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 083 454DG  
Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV400...900A7C2209-1R  
Governor no. : 9 420 083 232

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CT 8.3

## TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
Overflow valve : 1 419 992 198  
Inlet press., bar : 1.50  
Test nozzle holder assembly : 0 681 343 009  
Opening pressure, bar : 172...175  
Test lines : 1 680 750 014  
Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 900  
Rack travel in mm : 12.70...12.80  
Del. quantity cm<sup>3</sup>/ : 12.9...13.0  
100 s: (12.7...13.2)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 5.9...6.1  
Del. quantity cm<sup>3</sup>/ : 1.6...2.0  
100 s: (1.4...2.3)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 5.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Del. quantity : 129.0...130.0  
1000 : (127.0...132.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 104...112

Testing:

1st rack travel in: 11.70  
Speed rpm : 943...948  
2nd rack travel in: 4.00  
Speed rpm : 977...986  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control Lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 415...475

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 550  
Rack travel in m: 12.70...12.90  
5th speed rpm : 400  
Rack travel in m: 14.00...14.60

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 943...948

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Del. quantity cm<sup>3</sup>/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 x  
Edition : 21.09.92  
Replaces : 10.91  
Test oil : ISO-4113  
  
Combination no. : 9 400 083 459  
  
Injection pump  
Pump designation : PES6A95D12ORS2822  
EP type number : 9 400 084 029  
Governor  
Governor design. : RQV350...1250AB1235-  
2R  
Governor no. : 9 420 080 311

Customer-spec. information  
Customer : CUMMINS

Engine : 6 BT

1st version kW : 119.3  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85  
: (2.70...2.90)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 2.00...3.00

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.70...12.80

Del. quantity cm<sup>3</sup>/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.2

Del. quantity cm<sup>3</sup>/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 6.80...6.90

2nd speed rpm : 350

travel mm : 1.20...1.70

3rd speed rpm : 700

travel mm : 4.00...4.50

4th speed rpm : 1550

travel mm : 8.30...8.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1530

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250  
Aneroid pressure h: 600  
Del.quantity : 86.0...88.0  
1000 : (84.0...90.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 107...115

#### Testing:

1st rack travel in: 11.70  
Speed rpm : 1310...1320  
2nd rack travel in: 4.00  
Speed rpm : 1545...1575  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 63...71

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 475...575

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 600  
Rack travel mm : 12.70...12.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.90  
2nd pressure hPa : 320  
Rack travel in m: 11.70...11.80 \*  
3rd pressure hPa : 410  
Rack travel in m: 12.30...12.50

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 600  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 80.0...83.0  
1000 s: (77.5...85.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 64.0...67.0  
1000 s: (62.0...69.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1310...1320

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0...135.0  
1000 s: (110.0...140.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 6.0...10.0  
1000 s: (4.0...12.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 21.09.92  
Replaces : 08.92  
Test oil : ISO-4113  
  
Combination no. : 9 400 083 463  
  
Injection pump  
Pump designation : PES6A95D120RS2834  
EP type number : 9 400 084 032  
Governor  
Governor design. : RSV400...1100A8C2259  
-1R  
Governor no. : 9 420 083 261

Customer-spec. information  
Customer : CUMMINS

Engine : 6BT 5.9 L

1st version kW : 108.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85  
: (2.70...2.90)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference \* CS : 2.00...3.00

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.90...11.00

Del. quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.0...5.2

Del. quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del. quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 97...105

Testing:

1st rack travel in: 9.90  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.6

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 490...550

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 700  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 900  
Rack travel in m: 11.20...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 92.5...94.5  
1000 s: (90.5...96.5)  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 84.5...87.5  
1000 s: (82.5...89.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 115.0...135.0  
1000 s: (112.0...138.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

APPLICATION : C.D.C # 3355079

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 3,9 b 1  
 Edition : 21.09.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
  
 Combination no. : 9 400 085 243  
  
 Injection pump  
 Pump designation : FES4A80D32ORS1282-1  
 EP type number : 9 400 083 097  
 Governor  
 Governor design. : RS350/1500A2B2073-2R  
 Governor no. : 9 420 083 194

Customer-spec. information  
 Customer : MWM

Engine : D 229-4

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 047  
  
 Inlet press., bar : 1.50  
  
 Test nozzle holder  
 assembly : 0 681 343 009  
  
 Opening  
 pressure, bar : 172...175  
  
 Test lines : 1 680 750 003  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
 Prestroke mm : 2.65...2.75  
 : (2.60...2.80)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 9.20...9.30

Del. quantity cm<sup>3</sup>/ : 5.8...5.9

100 s : (5.6...6.0)

Spread cm<sup>3</sup> : 0.2

100 s : (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del. quantity cm<sup>3</sup>/ : 0.7...1.1

100 s : (0.5...1.2)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Del. quantity : 58.0...59.0

1000 : (56.5...60.5)

Spread cm<sup>3</sup> : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control lever

position degrees: 60...68

Testing:

1st rack travel in: 8.20



Speed rpm : 1540...1550  
2nd rack travel in: 4.00  
Speed rpm : 1585...1615  
4th rack travel in: 1700  
Speed rpm : 0.30...1.70

Remarks:

#### LOW IDLE 1

Control lever  
position degrees: 28...36  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 250  
Minimum rack trave: 6.80  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 4.00  
Speed rpm : 430...490  
Speed rpm : 550  
Maximum rack trave: 3.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1500  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 500  
Rack travel in m: 10.60...10.70  
3rd speed rpm : 900  
Rack travel in m: 10.20...10.40  
4th speed rpm : 1200  
Rack travel in m: 9.50...9.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 58.5...60.5  
1000 s: (56.5...62.5)  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 63.0...65.0  
1000 s: (61.0...67.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 8.20  
Speed rpm : 1540...1550

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 g  
 Edition : 21.09.92  
 Replaces : 08.89  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 305  
 Injection pump  
 Pump designation : PES6A95D410RS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1300AB1066-6L  
 Governor no. : 9 420 080 265

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kW : 125.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 10.40...10.50

Del. quantity cm<sup>3</sup>/ : 8.9...9.1  
 100 s: (8.7...9.3)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.9...7.1  
 Del. quantity cm<sup>3</sup>/ : 0.8...1.4  
 100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...1.30  
 2nd speed rpm : 500  
 travel mm : 2.30...2.80  
 3rd speed rpm : 750  
 travel mm : 4.10...4.30  
 4th speed rpm : 1500  
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1500  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del. quantity : 89.0...91.0  
 1000 : (87.0...93.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1630  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

TORQUE CONTROL  
Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 800  
Rack travel in m: 10.90...11.00  
4th speed rpm : 1000  
Rack travel in m: 10.60...10.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.90...11.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 450  
Rack travel in m: 10.50...10.60  
3rd pressure hPa : 300  
Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Aneroid pressure h: 700  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 57.0...61.0  
1000 s: (57.0...63.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 95.0...115.0  
1000 s: (-)  
Rack travel in mm : 14.50...14.70

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 g 2  
 Edition : 21.09.92  
 Replaces : 09.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 310  
 Injection pump  
 Pump designation : PES6A95D41ORS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1300AB1066-8L  
 Governor no. : 9 420 080 279

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 155.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.08)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.10...11.20

Del. quantity cm<sup>3</sup>/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del. quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del. quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 105...113

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1485...1515  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.70  
2nd pressure hPa : 450  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 300  
Rack travel in m: 9.70...9.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 59.5...61.5  
1000 s: (57.5...63.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...90.0  
1000 s: (-)  
Rack travel in mm : 13.60...13.80

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 g 3  
 Edition : 21.09.92  
 Replaces : 10.91  
 Test oil : ISO-4113

Combination no. : 9 400 085 315

Injection pump  
 Pump designation : PES6A95D410RS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1300AB1066-9L  
 Governor no. : 9 420 080 282

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kw : 125.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

---

Rack travel in mm : 10.40...10.50

---

Del. quantity cm<sup>3</sup>/ : 8.9...9.1  
 100 s : (8.7...9.3)

---

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 6.9...7.1  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s : (0.7...1.7)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 0.80...1.30

2nd speed rpm : 500  
 travel mm : 2.30...2.80

3rd speed rpm : 750  
 travel mm : 4.10...4.30

4th speed rpm : 1500  
 travel mm : 8.50...8.60

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1

Speed rpm : 1500  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 800  
 Del. quantity : 89.0...91.0  
 1000 : (87.0...93.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 105...113

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1470...1500  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

TORQUE CONTROL  
Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 800  
Rack travel in m: 10.90...11.00  
4th speed rpm : 1000  
Rack travel in m: 10.60...10.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 10.90...11.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.30  
2nd pressure hPa : 460  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 300  
Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Aneroid pressure h: 800  
Speed rpm : 1000  
Del. quantity cm<sup>3</sup>/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 50.0...52.0  
1000 s: (48.0...54.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 78.0...90.0  
1000 s: (-)  
Rack travel in mm : 13.60...13.80

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 6,0 g 4  
 Edition : 21.09.92  
 Replaces : 08.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 317  
 Injection pump  
 Pump designation : PES6A95D410RS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1300AB1066-9L  
 Governor no. : 9 420 080 282

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kW : 125.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 0.80...1.30

2nd speed rpm : 500  
 travel mm : 2.30...2.80

3rd speed rpm : 750  
 travel mm : 4.10...4.30

4th speed rpm : 1500  
 travel mm : 8.50...8.60

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1300

Aneroid pressure h: 800

Del.quantity : 89.0...91.0

1000 : (87.0...93.0)

Spread cm3 : 3.50

1000 : (6.00)

**RATED SPEED**



1st version  
Control lever  
position degrees: 105...113

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1470...1500  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

TORQUE CONTROL  
Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 800  
Rack travel in m: 10.90...11.00  
4th speed rpm : 1000  
Rack travel in m: 10.60...10.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 10.90...11.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.30  
2nd pressure hPa : 460  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 300  
Rack travel in m: 9.40...9.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Aneroid pressure h: 700  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 50.0...52.0  
1000 s: (48.0...54.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...90.0  
1000 s: (-)  
Rack travel in mm : 13.60...13.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,1 h  
 Edition : 21.09.92  
 Replaces : 04.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 340  
 Injection pump  
 Pump designation : PES6A95D410RS2795  
 EP type number : 9 400 084 020  
 Governor  
 Governor design. : RSV350...1250A0B1150  
 -5L  
 Governor no. : 9 420 083 249

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kw : 94.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test Lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 8.60...8.70  
 Del.quantity cm<sup>3</sup>/ : 6.2...6.4  
 100 s: (6.0...6.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.9...7.1  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s: (0.7...1.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 62.5...64.5  
 1000 : (60.5...66.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 106...114

Testing:  
 1st rack travel in: 7.60  
 Speed rpm : 1290...1300  
 2nd rack travel in: 4.00  
 Speed rpm : 1332...1362  
 4th rack travel in: 1500

Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 78...86

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.00

Speed rpm : 350

Rack travel in mm : 6.90...7.10

Rack travel in mm : 2.00

Speed rpm : 445...505

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 8.60...8.70

2nd speed rpm : 500

Rack travel in m: 8.60...8.80

5th speed rpm : 400

Rack travel in m: 9.80...10.40

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.60

Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : 90.0...110.0

1000 s: (87.0...113.0)

Rack travel in mm : 14.10...14.30

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 6.90...7.10

Del. quantity cm<sup>3</sup>/ : 9.0...15.0

1000 s: (7.0...17.0)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 351  
 Injection pump  
 Pump designation : PES6A95D410RS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1300AB1066-13L  
 Governor no. : 9 420 080 332

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kw : 147.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

K01

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.08)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 11.10...11.20  
 Del. quantity cm<sup>3</sup>/ : 9.7...9.9  
 100 s: (9.5...10.1)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.9...7.1  
 Del. quantity cm<sup>3</sup>/ : 0.8...1.4  
 100 s: (0.6...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...1.30  
 2nd speed rpm : 500  
 travel mm : 2.30...2.80  
 3rd speed rpm : 750  
 travel mm : 4.10...4.30  
 4th speed rpm : 1500  
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1500  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del. quantity : 97.0...99.0  
 1000 : (95.0...101.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 106...114

Testing:

1st rack travel in: 10.10  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1490...1520  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 62...70

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.10...11.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.70  
2nd pressure hPa : 500  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 350  
Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 84.0...87.0  
1000 s: (81.5...89.5)  
Aneroid pressure h: -  
Speed rpm : 500

K02

Del.quantity cm<sup>3</sup>/ : 59.0...61.0  
1000 s: (57.0...63.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...97.0  
1000 s: (-)  
Rack travel in mm : 13.40...13.60

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 353  
 Injection pump  
 Pump designation : PES6A95D410RS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1300AB1066-8L  
 Governor no. : 9 420 080 279

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 155.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

K03

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.08)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...1.30

2nd speed rpm : 500  
 travel mm : 2.30...2.80

3rd speed rpm : 750  
 travel mm : 4.10...4.30

4th speed rpm : 1500  
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1485...1515  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.70  
2nd pressure hPa : 450  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 300  
Rack travel in m: 9.70...9.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)

Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 59.5...61.5  
1000 s: (57.5...63.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 78.0...90.0  
1000 s: (-)  
Rack travel in mm : 13.60...13.80

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 10,0q15  
 Edition : 21.09.92  
 Replaces : 08.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 437  
 Injection pump  
 Pump designation : PE6P110A320RS3103Y  
 EP type number : 0 411 816 729  
 Governor  
 Governor design. : RQV250...1100PA589-3  
 Governor no. : 9 420 080 288

Customer-spec. information  
 Customer : VOLVO

Engine : THD 100 EC

1st version kW : 180.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 13.8...14.0

100 s: (13.5...14.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 3.0...3.4

100 s: (2.7...3.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.10...1.30

2nd speed rpm : 500  
 travel mm : 4.10...4.90

3rd speed rpm : 700  
 travel mm : 6.30...6.70

4th speed rpm : 950  
 travel mm : 6.30...6.70

5th speed rpm : 1100  
 travel mm : 7.00...7.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1175

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 138.0...140.0

1000 : (135.0...143.0)



Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 61...69

#### Testing:

1st rack travel in: 10.10  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 250  
Rack travel in mm : 5.20...5.40

#### CONSTANT REGULATION

Speed rpm : 250...425

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.10...11.20

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.80  
2nd pressure hPa : 280  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 430  
Rack travel in m: 10.90..11.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 106.0...108.0  
1000 s: (103.0...111.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...200.0  
1000 s: (166.0...204.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
1000 s: (27.5...36.5)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 10,0q16
Edition : 21.09.92
Replaces : 10.90
Test oil : ISO-4113
Combination no. : 9 400 087 438
Injection pump
Pump designation : PE6P110A320RS3108X
EP type number : 0 411 816 730
Governor
Governor design. : RQV250...1100PA589-3
Governor no. : 9 420 080 288

Customer-spec. information
Customer : VOLVO

Engine : THD100 ED

1st version kW : 203.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 9.00...12.00

K07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 16.0...16.2

100 s : (15.7...16.5)

Spread cm3 : 0.4

100 s : (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 3.0...3.4

100 s : (2.7...3.6)

Spread cm3 : 0.3

100 s : (0.6)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 1.10...1.30

2nd speed rpm : 500
travel mm : 4.10...4.90

3rd speed rpm : 700
travel mm : 6.30...6.70

4th speed rpm : 950
travel mm : 6.30...6.70

5th speed rpm : 1100
travel mm : 7.00...7.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1175

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 160.0...162.0

1000 : (157.0...165.0)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 61...69

#### Testing:

1st rack travel in: 11.10  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 250...425

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.10...12.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.40  
2nd pressure hPa : 280  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 700  
Rack travel in m: 11.70...11.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 106.0...108.0  
1000 s: (103.0...111.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...200.0  
1000 s: (166.0...204.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
1000 s: (27.5...36.5)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

#### Remarks:

Delivery valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
Edition : 21.08.92
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 087 468
Injection pump
Pump designation : PES5P120A720LS7174
EP type number : 0 412 725 806
Governor
Governor design. : RQV300...1050PA1041
Governor no. : 9 420 080 329

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM449 A

1st version kw : 184.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 105

Opening
pressure, bar : 207...210

Test lines : 1 680 750 075

Outside diameter
x Wall thickness
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm3/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...7.0

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
travel mm : 1.20...1.60

2nd speed rpm : 500
travel mm : 3.00...3.50

3rd speed rpm : 900
travel mm : 5.60...6.10

4th speed rpm : 1100
travel mm : 7.40...7.90

5th speed rpm : 1210
travel mm : 9.30...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 700

Del.quantity : 193.5...195.5

1000 : (190.5...198.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 111...119

Testing:

1st rack travel in: 13.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 66...74

Testing:

Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.70...6.90

CONSTANT REGULATION

Speed rpm : 380...320

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 340  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 520  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 960  
Rack travel in m: 14.10...14.20  
4th pressure hPa : 1040  
Rack travel in m: 14.30...14.40  
5th pressure hPa : -  
Rack travel in m: 10.80...11.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 208.5...211.5  
1000 s: (205.5...214.5)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1300  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 209.0...213.0  
1000 s: (206.0...216.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 197.0...217.0  
1000 s: (193.0...221.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CAS 8,3 h 1  
Edition : 12.10.92  
Replaces : 20.6.88  
Test oil : ISO-4113

Combination no. : 9 400 230 058

Injection pump  
Pump designation : PES6A95D320LS2647  
Governor  
Governor design. : RSV400...1100A2B2172  
-R

Customer-spec. information  
Customer : CASE

Engine : A 504 BDT

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 9 681 273 009

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 9 681 230 706

Outside diameter  
x Wall thickness  
x Length mm : 6,00x2,00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Rack travel in mm : 10.50  
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

K11

## BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 9.60...9.70

---

Del. quantity cm<sup>3</sup>/ : 10.4...10.6

---

100 s : (10.2...10.8)

---

Spread cm<sup>3</sup> : 0.35

---

100 s : (0.60)

---

2nd speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del. quantity cm<sup>3</sup>/ : 1.8...2.2  
100 s : (1.5...2.4)

Spread cm<sup>3</sup> : 0.35  
100 s : (0.55)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del. quantity : 104.5...106.5  
1000 : (102.5...108.5)

Spread cm<sup>3</sup> : 3.5  
1000 : (6.0)

## RATED SPEED

1st version  
Control lever  
position degrees: 46...54

Testing:  
1st rack travel in: 8.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

## LOW IDLE 1

Control lever  
position degrees: 26...34  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.40

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 750  
Rack travel in m: 10.25...10.35  
3rd speed rpm : 600  
Rack travel in m: 10.20...10.50

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 111.5...115.5  
1000 s: (109.5...117.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.60  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.00...150.00  
1000 s: (137.0...153.0)

Remarks:  
: CASE # A-182102

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 9,0 d 1  
Edition : 12.10.92  
Replaces : 7.86  
Test oil : ISO-4113

Combination no. : 9 400 230 086

Injection pump  
Pump designation : PES8A95D32ORS2708  
EP type number : 9 410 230 027  
Governor  
Governor design. : RQV325...1400AB1213R  
Governor no. : 9 420 231 012

## Customer-spec. information

Customer : IHC

Engine : D9L

1st version kw : 123.0  
Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 019

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 9 681 271 001

Outside diameter  
x Wall thickness  
x Length mm : 6,00x2,00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Rack travel in mm : 10.50  
Firing order : 1-8-7-3-6-5-4-2

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 11.00...11.10

Del. quantity cm<sup>3</sup>/ : 6.4...6.6

100 s : (6.2...6.8)

Spread cm<sup>3</sup> : 0.35

100 s : (0.60)

2nd speed rpm : 350

Rack travel in mm : 6.70...6.90

Del. quantity cm<sup>3</sup>/ : 0.9...1.3

100 s : (0.6...1.5)

Spread cm<sup>3</sup> : 0.35

100 s : (0.55)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1580

Rack travel in mm : 8.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del. quantity : 64.0...66.0

1000 : (62.0...68.0)

Spread cm<sup>3</sup> : 3.5

1000 : (6.0)

## RATED SPEED

1st version

Control lever

position degrees: 62...70

Testing:

1st rack travel in: 10.00

Speed rpm : 1450...1460

2nd rack travel in: 4.00

Speed rpm : 1550...1580

4th rack travel in: 1650

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15



Testing:

Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.70...6.90  
Rack travel in mm : 2.00  
Speed rpm : 630...690

TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.40...11.60  
2nd speed rpm : 1300  
Rack travel in m: 11.00...11.10

START CUT-OUT

Speed 1/min : 205...265

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 840  
Del.quantity cm<sup>3</sup>/ : 55.0...58.0  
1000 s: (52.5...60.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1450...1460

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...  
1000 s: (175.0...)

Remarks:

: CASE # A-182102

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 j7  
Edition : 12.10.92  
Replaces : 23.3.90  
Test oil : ISO-4113

Combination no. : 9 400 231 241

Injection pump  
Pump designation : PES6P120A72ORS6016-1  
Governor  
Governor design. : RQV325...850PA721-5K

Cust. part no. : \*

Customer-spec. information  
Customer : MACK

Engine : E6 400 4VH

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 0.2

Opening  
pressure, bar : 295...305

Test lines : 9 681 230 735

Outside diameter  
x Wall thickness  
x Length mm : 6.35x1.70x838.2

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05  
                  : (2.90...3.10)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

K15

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 13.20...13.30

---

Del.quantity cm<sup>3</sup>/ : 18.3...18.5  
100 s : (18.0...18.9)

---

Spread cm<sup>3</sup> : 0.5  
100 s : (0.75)

---

2nd speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 3.0...3.4  
100 s : (2.8...3.6)

Spread cm<sup>3</sup> : 1.0  
100 s : (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Del.quantity : 183.0...185.0  
1000 : (180.0...189.0)

Spread cm<sup>3</sup> : 5.0  
1000 : (7.5)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...58

Testing:  
1st rack travel in: 12.20  
Speed rpm : 890...900

2nd rack travel in: 4.00  
Speed rpm : 995...1025

4th rack travel in: 1050  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 10...16

Testing:  
Speed rpm : 250  
Minimum rack travel: 6.60  
Speed rpm : 325

Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 700  
Rack travel in m: 13.40...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.80...13.90  
4th speed rpm : 500  
Rack travel in m: 13.20...13.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : —  
1000 s: (193.5...205.5)  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 213.0...219.0  
1000 s: (210.0...222.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 890...900

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)

#### LOW IDLE

Speed rpm : 325  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
1000 s: (28.0...36.0)

#### Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 734AC  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV300...1075PA746  
 Governor no. : 0 421 813 477

Customer-spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 270.0  
 Rated speed : 2150

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 581 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

K17

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1075  
 Rack travel in mm : 9.80...9.90  
 Del. quantity cm<sup>3</sup>/ : 10.2...10.6  
 100 s : (9.9...10.8)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s : (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.30...1.40  
 2nd speed rpm : 380  
 travel mm : 2.30...2.70  
 3rd speed rpm : 430  
 travel mm : 2.80...3.30  
 4th speed rpm : 700  
 travel mm : 5.30...5.60  
 5th speed rpm : 1120  
 travel mm : 8.40...8.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1075  
 Del. quantity : 102.0...106.0  
 1000 : (99.5...108.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 8.80  
Speed rpm : 1115...1125  
2nd rack travel in: 5.50  
Speed rpm : 1140...1170  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 15...23

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 315...465

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1075  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 650  
Rack travel in m: 9.80...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1115...1125

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 734AD  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RUV300...1075PA746  
 Governor no. : 0 421 813 477

Customer spec. information  
 Customer : KHD

Engine : BF12L513

1st version kW : 294.0  
 Rated speed : 2150

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1075

Rack travel in mm : 10.40...10.50

Del. quantity cm<sup>3</sup>/ : 11.3...11.7

100 s : (11.0...11.9)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.2)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.30...1.40

2nd speed rpm : 380

travel mm : 2.30...2.70

3rd speed rpm : 430

travel mm : 2.80...3.30

4th speed rpm : 700

travel mm : 5.30...5.60

5th speed rpm : 1120

travel mm : 8.40...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

Del. quantity : 113.0...117.0

1000 : (110.5...119.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 9.40  
Speed rpm : 1115...1125  
2nd rack travel in: 5.50  
Speed rpm : 1145...1175  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 15...23

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 315...465

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1075  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 650  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1115...1125

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 2,5 W39  
 Edition : 27.10.92  
 Replaces : 08.10.91  
 Test oil : ISO-4113

Combination no. : 0 400 075 929

Injection pump  
 Pump designation : PES5M55C320RS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF34C/2300M64-18  
 Governor no. : 0 420 021 159

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA

1st version kW : 92.0

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

K21

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

**RATED SPEED**

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

**SET IDLE CONTROL LEVER  
 POSITION**

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever



position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.5

Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 520...620  
Speed rpm : 1000  
Maximum rack travel: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
                                  : (4,1...4,5)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 49.5...51.0  
                          1000 s: (48.5...52.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                          1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                          1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                          1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                          1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
                          1000 s: (4.0...8.5)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12.7...14.1)  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (41.0...49.0)  
Current A : 1.8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1,8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.
- With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.457...2.517 (2.427...2.547) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0)

cm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457...2.517 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 01.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 929  
 Injection pump  
 Pump designation : PES5M55C32ORS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/230OM64-18  
 Governor no. : 0 420 021 159

Cust. part no. : T8

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA ALDA

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 1 688 901 111

Opening  
 pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.7...52.7

1000 : (50.7...53.7)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 520...620  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,20...4,40  
                                  : (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
                          1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                          1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
                          1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 54.0...0.0  
                          1000 s: (54.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
                          1000 s: (29.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
                          1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,7...14,1)  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (42,5...50,5)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 54,0 1,8A

Remarks:

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 16.8°...17.2°  
(16.7...17.3°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Pin projection = 16.60...16.70 mm

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.457...2.517  
(2.427...2.547) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 21,5...22,5 (20,5...23,5)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
U = 1.633...1.639 (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.457...  
2.517 V must be attained.

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of

starting cam) up to 1000 1/min.  
-Control-lever position 33.0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 315 1/min. and pu = 450 mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 W40  
 Edition : 23.10.92  
 Replaces : 11.10.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 930  
 Injection pump  
 Pump designation : PES5M55C320RS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M74-1  
 Governor no. : 0 420 021 156

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : UM602A-D/A (KAT)

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

K27

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 150  
Minimum rack trave: 10 +1  
Speed rpm : 345  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.50  
Speed rpm : 550...650  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4.2...4.4  
                  : (4,1...4,5)

#### TORQUE CONTROL

##### Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

##### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 49.5...51.0  
                  1000 s: (48.5...52.0)  
Spread cm3 : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm3/ : 48.5...50.5  
                  1000 s: (47.5...51.5)  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
                  1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

##### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm3/ : 29.0...33.0  
                  1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 345  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 5.0...6.0  
                  1000 s: (4.0...8.5)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

##### Control lever at idle stop

Speed rpm : 370  
Rack travel in mm : (10,0...11.4)  
Del.quantity cm3/ : -  
                  1000 s: (27.5...35.5)  
Current A : 1.8

##### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0 1.8A

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LΦA



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
Edition : 27.10.92  
Replaces : 01.09.92  
Test oil : ISO-4113

Combination no. : 0 400 075 930

Injection pump  
Pump designation : PES5M55C320R3177  
EP type number : 0 410 055 974  
Governor  
Governor design. : RSF340/2300M74-1  
Governor no. : 0 420 021 156

Cust. part no. : T8

Customer-spec. information  
Customer : MB-PKW

Engine : DM602A-D/A (KAT)

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 1 688 901 111

Opening  
pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)

L02

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.7...52.7

1000 : (50.7...53.7)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12 FD<270  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 150 \*  
Minimum rack trave: 10.0+1  
Speed rpm : 345  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.50  
Speed rpm : 550...650  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### LOW IDLE 2

##### Control Lever

position degrees: 8-12FD 270  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5,6

#### Testing:

Speed rpm : 220  
Rack travel in mm : 8,0 \*\*  
Speed rpm : 345  
Rack travel in mm : 5,5...5,7  
Speed rpm : 580  
Rack travel in mm : 2,5  
Speed rpm : 680  
Rack travel in mm : 2,5

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4,2-4,4FD270  
: 4,7-4,9 FD 270

#### TORQUE CONTROL

##### Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

##### 1st version

##### Setting

Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

##### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050

L03

Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)

Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 54.0...0.0  
1000 s: (54.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

##### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
1000 s: (29.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 345  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 370  
Rack travel in mm : (10,0...11,4)  
Del. quantity cm<sup>3</sup>/ : -  
1000 s: (29,0...37,0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : -  
min. 1000 s: 54,0 1,8A

Remarks:

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)  
Control lever on full-load stop. At  $n = 1000$  min  
 $I = 2.5$  A, difference in delivery referenced to  
delivery (5.6...7.6) ccm/1000 strokes.

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $16.8^\circ \dots 17.2^\circ$   
( $16.7 \dots 17.3^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.25 mm

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.457...2.517  
(2.427...2.547) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 21,5...22,5 (20,5...23,5)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.457...  
2.517 V must be attained.

\* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $44,5^\circ$  max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $42,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_a = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 28.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 935  
 Injection pump  
 Pump designation : PES5M55C32ORS158-1  
 EP type number : 0 410 055 979  
 Governor  
 Governor design. : RSF340/2300M65-4  
 Governor no. : 0 420 021 144

Cust. part no. T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-ECE

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

L05

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
                                  : (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
                                  1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                                  1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                                  1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                                  1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
                                  1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
                                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
                                  1000 s: (41,0...49,0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position 33,0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
Edition : 01.09.92
Replaces : -
Test oil : ISO-4113
Combination no. : 0 400 075 935
Injection pump
Pump designation : PES5M55C32ORS158-1
EP type number : 0 410 055 979
Governor
Governor design. : RSF340/2300M65-4
Governor no. : 0 420 021 144

Cust. part no. : T8

Customer-spec. information
Customer : MB-PKW

Engine : OM602A-ECE ALDA

1st version kw : 92.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder
assembly : 0 681 901 111

Opening
pressure, bar : 144...150

Test Lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

L08

Rack travel in mm : 20.00...22.00
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.2...5.3

100 s: (5.1...5.4)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.6...0.7

100 s: (0.5...1.0)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 52.5...53.5

1000 : (51.5...54.5)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER
POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 52.5...53.5  
1000 s: (51.5...54.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm3/ : 51.0...52.5  
1000 s: (50.0...53.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 53.0...0.0  
1000 s: (53.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 6.5...7.5  
1000 s: (5.5...10.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,6...14,0  
Del.quantity cm3/ : -  
1000 s: (42,0...50,0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 53,0 1,8A



Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position 33.0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device

KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 c7  
 Edition : 27.10.92  
 Replaces : 08.10.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 936  
 Injection pump  
 Pump designation : PESSM55C32ORS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M64-14  
 Governor no. : 0 420 021 142

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.55...0.65

100 s: (0.45...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

100G : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.4

Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack travel: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 390  
Rack travel in mm : 4,2...4,4  
                                  : (4,1...4,5)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
                  1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm3/ : 48.5...50.5  
                  1000 s: (47.5...51.5)  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
                  1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
                  1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.5...6.5  
                  1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm3/ : -  
                  1000 s: (41,0...49,0)  
Current A : 1,8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

#### Testing and adjusting the control-rod- travel sensor with evaluation circuit

KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33.0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB  
 Edition : 27.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 936  
 Injection pump  
 Pump designation : PES5M55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M64-14  
 Governor no. : 0 420 021 142

Cust. part no. : T8

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 688 901 111

Opening  
 pressure, bar : 144...150

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.2...5.3

100 s: (5.1...5.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.65...0.75

100 s: (0.55...1.0)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 52.5...53.5

1000 : (51.5...54.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

**RATED SPEED**

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

**SET IDLE CONTROL LEVER POSITION**

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack travel: 1.80

SET IDLE AUXILIARY SPRING  
Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

Measurement  
Speed 1/min : 1000  
1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 51.0...52.5  
1000 s: (50.0...53.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 53.0...0.0  
1000 s: (53.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 6.5...7.5  
1000 s: (5.5...10.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (42,0...50,0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 53,0 1,8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit

KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33.0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 C2  
 Edition : 28.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113

Combination no. : 0 400 075 937

Injection pump  
 Pump designation : PES5M55C32ORS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/Z300M74  
 Governor no. : 0 420 021 140

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever



position degrees: 8...12  
 Setting point w/out bumper spring  
 Speed rpm : 345  
 Rack travel in mm : 5.4

Testing:

Speed rpm : 150  
 Minimum rack trave: 10.0+1  
 Speed rpm : 345  
 Rack travel in mm : 5.30...5.50  
 Rack travel in mm : 2.50  
 Speed rpm : 540...640  
 Speed rpm : 1000  
 Maximum rack trave: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
 Rack travel in mm : 4.2...4.4  
                         : (4.1...4.5)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
 Rack travel in m: 13.90...14.00  
 2nd speed rpm : 1600  
 Rack travel in m: 13.10...13.30  
 3rd speed rpm : 2200  
 Rack travel in m: 12.30...12.50

Aneroid/Altitude  
 Compensator Test

1st version

Setting  
 Speed rpm : 1000  
 Pressure hPa : 1600  
 Rack travel mm : 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
 Rack travel in m: 3.90...4.20  
 2nd pressure hPa : 750  
 Rack travel in m: 5.70...6.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
 Speed rpm : 1600  
 Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
                         1000 s: (49.0...52.5)  
 Spread cm<sup>3</sup> : 2.50  
                         1000 s: (3.5)  
 Aneroid pressure h: 1850  
 Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                         1000 s: (47.5...51.5)  
 Spread cm<sup>3</sup> : 2.50  
                         1000 s: (3.00)  
 Aneroid pressure h: 1050  
 Speed rpm : 1000  
 Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                         1000 s: (32.0...35.0)  
 Spread cm<sup>3</sup> : 2.50  
                         1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                         1000 s: (52.0...0.0)  
 Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
 Aneroid pressure h: 1850  
 Speed rpm : 2500  
 Rack travel in mm : 8.10...8.50  
 Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                         1000 s: (28.0...34.0)  
 Spread cm<sup>3</sup> : 2.50  
                         1000 s: (3.00)

LOW IDLE

Speed rpm : 345  
 Rack travel in mm : 5.30...5.50  
 Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
                         1000 s: (4.0...8.5)  
 Spread cm<sup>3</sup> : 1.00  
                         1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
 REGULATION (ELR)

Control lever at idle stop  
 Speed rpm : 370  
 Rack travel in mm : (10.0...11.4)  
 Del.quantity cm<sup>3</sup>/ : -  
                         1000 s: (31,5...39,5)  
 Current A : 1.8

Control lever at full-load stop  
 Speed rpm : 2950  
 Rack travel in mm : 0.0...1.0  
 Current short-duration A : 3,0  
 Starting test  
 Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : -  
 min. 1000 s: 52.0 1.8A

Remarks:

:

\* Sliding sleeve pre-travel = 4.7 mm

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 345$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n =$   
1000 min.  $-1$ ,  
 $I = 2.5$  A, difference in delivery  
referenced to full-load  
delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19,3^\circ \dots 19,7^\circ$   
( $19,2^\circ \dots 19,8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB  
 Edition : 28.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 937  
 Injection pump  
 Pump designation : PES5M55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/23COM74  
 Governor no. : 0 420 021 140

Cust. part no. : T8

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 688 901 111

Opening  
 pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

L20

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.2...5.3

100 s: (5.1...5.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 52.5...53.5

1000 : (51.5...54.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

**RATED SPEED**

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

**SET IDLE CONTROL LEVER POSITION**

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12 FD<270  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 150 \*  
Minimum rack trave: 10,0+1  
Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### LOW IDLE 2

Control lever  
position degrees: 8-12FD 270  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.3...5.5

#### Testing:

Speed rpm : 220  
Rack travel in mm : 8,0\*\*  
Speed rpm : 345  
Rack travel in mm : 5,3...5,5  
Speed rpm : 540  
Rack travel in mm : 2,5  
Speed rpm : 640  
Rack travel in mm : 2,5

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050

L21

Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 51.0...52.5  
1000 s: (50.0...53.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1950  
Speed rpm : 1000  
Del.quantity cm3/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 53.0...0.0  
1000 s: (53.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 6.0...7.0  
1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 370  
Rack travel in mm : (10,0...11,4)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (32,5...40,5)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 53,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.25 mm

\* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 44,5° max.

ad

0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position 42,0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 345 1/min and pu = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-

travel sensor with evaluation circuit

KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At n = 1000 m

I = 2.5 A, difference in delivery referenced to

delivery (5.6...7.6) ccm/1000 strokes.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C10  
 Edition : 28.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 944  
 Injection pump  
 Pump designation : PES5M55C32ORS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M64-12  
 Governor no. : 0 420 021 127

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA MJ90

1st version kw : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

-1

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.7...4.9  
: (4.6...5.0)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 49.5...51.0  
1000 s: (48.5...52.0)  
Spread cm3 : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.0...8.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12.6...14.0)  
Del.quantity cm3/ : -  
1000 s: (41.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52.0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7°...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...2.547 V must be attained.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 28.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 944  
 Injection pump  
 Pump designation : PES5M55C32ORS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M64-12  
 Governor no. : 0 420 021 127

Cust. part no. : T8

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA MJ90

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 688 901 111

Opening  
 pressure, bar : 144...150

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13,70...13.80

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.6...5.8

Del. quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure in: 1350

Del. quantity : 51.7...52.7

1000 : (50.7...53.7)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,7...4,9  
: (4,6...5,0)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 54.0  
1000 s: -  
Rack travel in mm : 20.1

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
1000 s: (29.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (42,5...50,5)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 54,0 / 1,8A

Remarks:

1000 1/min; a voltage of 2.487...2.547  
(2.457...2.577) V must be displayed  
on the digital voltmeter.

:  
CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position 33.0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 16.8°...17.2°  
(16.7...17.3°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 29.10.92  
 Replaces : 08.07.92  
 Test oil : ISO-4113

Combination no. : 0 400 075 959

Injection pump  
 Pump designation : PES5M55C320RS166  
 EP type number : 0 410 055 980  
 Governor  
 Governor design. : RSF340/2300M64-1  
 Governor no. : 0 420 021 050

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

MD1

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.8)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.0

Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.50  
Speed rpm : 525...625  
Speed rpm : 1000  
Maximum rack trave: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.20...4.40  
                              : (4.10...4.50)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1600  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 2200  
Rack travel in m: 12.80...13.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
                  1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm3/ : 48.5...50.5  
                  1000 s: (47.5...51.5)  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
                  1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 31.0...35.0  
                  1000 s: (30.0...36.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 5.0...6.0  
                  1000 s: (4.0...8.5)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12.4...13.8)  
Del.quantity cm3/ : -  
                  1000 s: (41.0...49.0)  
Current A : 1.8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52.0 / 1,8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_{vi} = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2,531...2,590 (2,502...2,620) V must be displayed on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18,5...19,5 (17,5...20,5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-

load stop; voltage value of 2,531...2,590 V must be attained.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 29.10.92  
 Replaces : 08.07.92  
 Test oil : ISO-4113

Combination no. : 0 400 075 966

Injection pump  
 Pump designation : PES5M55C32ORS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M64-11  
 Governor no. : 0 420 021 086

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl. ALDA

1st version kw : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

MD4

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 13.90...14.00

---

Del. quantity cm<sup>3</sup>/ : 5.1...5.2  
 100 s : (5.0...5.3)

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Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 315.0  
 Rack travel in mm : 5.4...5.6  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1  
 100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1850  
 Del. quantity : 51.0...52.0  
 1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8.1...8.5  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,7...1,8

LOW IDLE 1  
 Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
                                  : (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
                                  1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                                  1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                                  1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                                  1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
                                  1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
                                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,4...13.8)  
Del.quantity cm<sup>3</sup>/ : -  
                                  1000 s: (41.0...49.0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 / 1,8A



Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 29.10.92  
 Replaces : 08.07.92  
 Test oil : ISO-4113

Combination no. : 0 400 075 980

Injection pump  
 Pump designation : PES5M55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M64  
 Governor no. : 0 420 021 050

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A / ALDA

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.20...4.40  
: (4.10...4.50)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12.4...13.8)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (41.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current  
short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 / 1.8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction,  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-

load stop; voltage value of 2.472...  
2.532 V must be attained.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W37  
 Edition : 29.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 956  
 Injection pump  
 Pump designation : PES6M55C32URS181  
 EP type number : 0 410 056 983  
 Governor  
 Governor design. : RSF305/2125M64-20  
 Governor no. : 0 420 021 168

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 USA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 14.10...14.20

Del. quantity cm<sup>3</sup>/ : 5.9...6.0  
 100 s : (5.8...6.1)

Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 280.0  
 Rack travel in mm : -  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.5...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1900  
 Del. quantity : 59.0...60.0  
 1000 : (58.0...61.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 9.2...9.6  
 Speed rpm : 2500  
 4th rack travel in: 2700  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,9...2,0

LOW IDLE 1  
 Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 280

#### Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Rack travel in mm : 2,5  
Speed rpm : 550...650  
Speed rpm : 1000  
Maximum rack trave: 2.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4.3...4.5  
: (4.2...4.6)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.20  
3rd speed rpm : 2000  
Rack travel in m: 12.20...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.80...1.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.70...3.90  
2nd pressure hPa : 750  
Rack travel in m: 5.20...5.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1900  
Speed rpm : 1600  
Del.quantity cm3/ : 56.5...58.0  
1000 s: (55.5...59.0)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1900  
Speed rpm : 2000  
Del.quantity cm3/ : 54.0...56.0  
1000 s: (53.0...57.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 38.0...39.0  
1000 s: (37.0...40.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1900  
Speed rpm : 2300  
Rack travel in mm : 9.20...9.60  
Del.quantity cm3/ : 37.0...41.0  
1000 s: (36.0...42.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 280  
Rack travel in mm : -  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 305  
Rack travel in mm : (11.5...12.9)  
Del.quantity cm3/ : -  
1000 s: (41.0...49.0)  
Current A : 1.8

Control lever at full-load stop  
Speed rpm : 2700  
Rack travel in mm : 0.0...1.0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52.0 / 1.8A

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position  $33,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit

KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.487...2.547  
(2.457...2.577) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 24.0...25.0 (23.0...26.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633...1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.487...  
2.547 V must be attained.

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $16.8^\circ...17.2^\circ$   
( $16.7...17.3^\circ$ ) angular displacement of  
cam following start of delivery of

cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Sliding sleeve pre-travel =  
5,25...5,75 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W38  
 Edition : 29.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 958  
 Injection pump  
 Pump designation : PES6M55C32ORS181  
 EP type number : 0 410 056 983  
 Governor  
 Governor design. : RSF315/2125M64-19  
 Governor no. : 0 420 021 162

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 USA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

M13

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.10...14.20

Del. quantity cm<sup>3</sup>/ : 5.9...6.0

100 s : (5.8...6.1)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.95)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1900

Del. quantity : 59.0...60.0

1000 : (58.0...61.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9.2...9.6

Speed rpm : 2300

4th rack travel in: 2700

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.9...2.0

LOW IDLE 1

Control Lever



position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Rack travel in mm : 2,5  
Speed rpm : 550...650  
Speed rpm : 1000  
Maximum rack trave: 2.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4.3...4.5  
                  : (4.2...4.6)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.20  
3rd speed rpm : 2000  
Rack travel in m: 12.20...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.80...1.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.70...3.90  
2nd pressure hPa : 750  
Rack travel in m: 5.20...5.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1900  
Speed rpm : 1600  
Del.quantity cm3/ : 56.5...58.0  
                  1000 s: (55.5...59.0)  
Spread cm3 : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1900  
Speed rpm : 2000  
Del.quantity cm3/ : 54.0...56.0  
                  1000 s: (53.0...57.0)

Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 38.0...39.0  
                  1000 s: (37.0...40.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1900  
Speed rpm : 2300  
Rack travel in mm : 9.20...9.60  
Del.quantity cm3/ : 37.0...41.0  
                  1000 s: (36.0...42.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 5.5...6.5  
                  1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (11.5...12.9)  
Del.quantity cm3/ : -  
                  1000 s: (41.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2700  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

:

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position  $35,5^\circ$ , max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position  $33,0^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop. At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $16,8^\circ \dots 17,2^\circ$  ( $16,7 \dots 17,3^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 24.0...25.0 (23.0...26.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633 \dots 1.639$  (1.635...1.637) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...2.547 V must be attained.

Sliding sleeve pre-travel = 5,25...5,75 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W39  
 Edition : 29.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 959  
 Injection pump  
 Pump designation : PES6M55C320RS180  
 EP type number : 0 410 056 984  
 Governor  
 Governor design. : RSF315/2300M64-17  
 Governor no. : 0 420 021 157

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A-D/A (KAT)

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.95)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 8.4...8.8

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 520...620  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.2...4.4  
: (4.1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.40...8.80  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (13.1...14.5)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (43.0...51.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 100  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 250$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF  
-Control-lever position  $35.5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33.0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $16.8^\circ \dots 17.2^\circ$   
( $16.7^\circ \dots 17.3^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.457...2.517  
(2.427...2.547) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 21.0...22.0 (20.0...23.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.457...  
2.517 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W28  
 Edition : 29.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113

Combination no. : 0 400 076 962

Injection pump  
 Pump designation : PES6M55C320RS157  
 EP type number : 0 410 056 993  
 Governor  
 Governor design. : RSF315/2300M64-15  
 Governor no. : 0 420 021 143

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : DM603A-Abgasl.

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.95)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.2...4.4  
: (4.1...4.5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12.6...14.0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (41.0...49.0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 100  
Rack travel in mm : 0.0...1.0  
Current

short-duration A : 3.0

#### Starting test

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position 33.0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2°...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit

KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel

delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633...1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 29.10.92  
 Replaces : 01.09.92  
 Test oil : ISO-4113

Combination no. : 0 400 076 968

Injection pump  
 Pump designation : PES6M55C32ORS178  
 EP type number : 0 410 056 986  
 Governor  
 Governor design. : RSF315/2125M64-13  
 Governor no. : 0 420 021 128

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 USA ALDA

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.30

Del. quantity cm<sup>3</sup>/ : 5.8...5.9  
 100 s: (5.7...6.0)

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

2nd speed rpm : 290.0  
 Rack travel in mm : 5.6...5.9  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s: (0.5...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1850  
 Del. quantity : 58.0...59.0  
 1000 : (57.0...60.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 6.5...6.9  
 Speed rpm : 2300  
 4th rack travel in: 2700  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,4...1,5

LOW IDLE 1  
 Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.7

Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.60...5.90  
Speed rpm : 1000  
Maximum rack travel: 1.50

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 3,60...4,10  
: (3,50...4,20)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 2000  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.40...0.80

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.50...3.70  
2nd pressure hPa : 750  
Rack travel in m: 5.00...5.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 54.5...56.0  
1000 s: (53.5...57.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
1000 s: (48.0...52.0)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 38.0...39.0  
1000 s: (37.0...40.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2300  
Rack travel in mm : 6.50...6.90  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.60...5.90  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (11,7...13,1)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2700  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 16.8°...17.2°  
(16.7...17.3°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Sliding sleeve pre-travel = 5.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 44,5° max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position 42,0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 29.10.92  
 Replaces : 08.07.92  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 980  
 Injection pump  
 Pump designation : PES6M55C320RS157  
 EP type number : 0 410 056 993  
 Governor  
 Governor design. : RSF315/2300M64-10  
 Governor no. : 0 420 021 085

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A / ALDA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1  
 Control Lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12.8...14.2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (42.0...49.9)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 / 1.8A

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  $U = 1.633 \dots 1.639$  (1.635...1.637) V is

indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472...2.532 V must be attained.

Pin projection = 16.60...16.70 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 29.10.92  
 Replaces : 08.07.92  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 987  
 Injection pump  
 Pump designation : PES6M55C320RS157  
 EP type number : 0 410 056 993  
 Governor  
 Governor design. : RSF315/2300M64-2  
 Governor no. : 0 420 021 059

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A / ALDA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

M28

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.20...4.40  
: (4.10...4.50)

#### TORQUE CONTROL

Torque control curve - 1st version:

1st speed rpm : 1000  
Rack travel in mm : 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in mm : 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in mm : 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in mm : 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in mm : 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12.8...14.2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (42.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0



Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

**CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF**

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

**CHECKING THE PNEUMATIC SHUTOFF BOX**

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEF\ 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEF-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  (1.635...1.637) V is

indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.

Pin projection = 16.60...16.70 mm

**CORRECTION OF INJECTED-FUEL QUANTITY**

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 30.10.92  
 Replaces : 08.07.92  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 992  
 Injection pump  
 Pump designation : PES6M55C320RS157  
 EP type number : 0 410 056 993  
 Governor  
 Governor design. : RSF315/2300M64  
 Governor no. : 0 420 021 044

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A / ALDA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

N03

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm3 : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm3 : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.20...4.40  
: (4.10...4.50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

##### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12.8...14.2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (42.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0

Remarks:

:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEF 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEF-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  (1.635...1.637) V is

indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 30.10.92  
 Replaces : 08.07.92  
 Test oil : ISO-4113

Combination no. : 0 400 076 996

Injection pump  
 Pump designation : PES6M55C320RS155  
 EP type number : 0 410 056 997  
 Governor  
 Governor design. : RSF315/2300M62  
 Governor no. : 0 420 021 035

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

NO6

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s : (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 7.8...8.2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 0.9...1.0

LOW IDLE 1

Control lever  
 position degrees: 13...17

Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 1.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack travel: 1.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.20...4.40  
: (4.10...4.50)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in m: 10.90...11.10  
3rd speed rpm : 2200  
Rack travel in m: 10.60...10.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000 s: (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Speed rpm : 2500  
Rack travel in mm : 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

##### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12.6...14.0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (32.0...40.0)  
Current A : 1.8

##### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current

short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 55.0 / 1.8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover

point (of starting cam).

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2,043...2,103  
(2,013...2,132) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 18,0...19,0 (17,0...20,0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633...1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.487...  
2.547 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 599  
 Injection pump  
 Pump designation : PES6A90D41DRS2817  
 EP type number : 0 410 896 090  
 Governor  
 Governor design. : RQV300...1100AB1262-1L  
 Governor no. : 0 420 212 235

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8365.25.513

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ' : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 8.1...8.2  
 100 s: (7.9...8.4)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.4)

2nd speed rpm : 300.0  
 Rack travel in mm : 7.5...7.7  
 Del.quantity cm<sup>3</sup>/ : 0.8...1.2  
 100 s: (0.6...1.4)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...1.30  
 2nd speed rpm : 480  
 travel mm : 2.10...2.60  
 3rd speed rpm : 530  
 travel mm : 2.60...3.10  
 4th speed rpm : 615  
 travel mm : 3.20...3.70  
 5th speed rpm : 1150  
 travel mm : 8.10...8.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1250  
 Rack travel in mm : 9.10...11.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 81.5...82.5  
 : (79.5...84.5)  
 1000 : 3.00  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (4.50)

RATED SPEED



1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 56...74

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 7.50...7.70

CONSTANT REGULATION  
Speed rpm : 425...575

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 500  
Rack travel in m: 12.10...12.20  
3rd speed rpm : 880  
Rack travel in m: 11.80...12.00  
4th speed rpm : 990  
Rack travel in m: 11.40...11.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 84.0...86.0  
1000 s: (81.5...88.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : 159.0...169.0  
1000 s: (156.0...172.0)  
Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM  
 Edition : 23.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 864 094  
 Injection pump  
 Pump designation : PES4A90D320/3RS2743  
 EP type number : 0 410 894 034  
 Governor  
 Governor design. : RSV325...1150A5C505-5R  
 Governor no. : 0 420 233 289

Customer-spec. information  
 Customer : MWM

Engine : TD226B-4

1st version kW : 63.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.50...9.60

Del. quantity cm<sup>3</sup>/ : 7.1...7.2

100 s: (6.9...7.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 6.7...6.9

Del. quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del. quantity : 71.5...72.5

1000 : (69.5...74.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 8.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1330  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.70...6.90  
Rack travel in mm : 2.00  
Speed rpm : 430...490

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.50...9.60  
2nd speed rpm : 500  
Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 52.0...54.0  
1000 s: (49.5...56.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 8.50  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 132.0...142.0  
1000 s: (129.0...145.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

Excavator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MM 6,2 e 6  
 Edition : 23.10.92  
 Replaces : 05.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 122  
 Injection pump  
 Pump designation : PES6A90D320/3RS2660  
 EP type number : 0 410 896 078  
 Governor  
 Governor design. : RSV325...1200AOC2182  
 -3R  
 Governor no. : 0 420 233 212

Customer-spec. information  
 Customer : MM

Engine : TD226B-6

1st version kW : 123.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1180

Rack travel in mm : 11.60...11.70

Del. quantity cm<sup>3</sup>/ : 8.9...9.0

100 s: (8.7...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 7.1...7.3

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1180

Aneroid pressure h: 700

Del. quantity : 89.0...90.0

1000 : (87.0...92.0)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

RATED SPEED

1st version

Control lever  
position degrees: 90...98

Testing:

1st rack travel in: 10.60  
Speed rpm : 1220...1230  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
3rd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1435  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.10...7.30  
Rack travel in mm : 2.00  
Speed rpm : 485...545

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1180  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 700  
Rack travel in m: 12.40...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.40...12.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 320  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 180  
Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700  
Del.quantity cm3/ : 93.0...95.0  
1000 s: (90.5...97.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.0...62.0  
1000 s: (59.0...64.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1220...1230

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 128.0...138.0  
1000 s: (125.0...141.0)  
Rack travel in mm : 19.50...21.00

Remarks:

APPLICATION

Tractor (tractor engines)

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM  
 Edition : 23.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 178  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV550...1100ADC2190  
 -56R  
 Governor no. : 0 420 233 295

**Customer-spec. information**

Customer : C.D.C.

Engine : 6CTA-830

1st version kW : 157.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 12.3...12.5

100 s : (12.1...12.7)

Spread cm<sup>3</sup> : 0.4

100 s : (0.6)

2nd speed rpm : 550.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s : (1.3...2.2)

Spread cm<sup>3</sup> : 0.6

100 s : (0.8)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Del.quantity : 123.0...125.0

1000 : (121.0...127.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

**RATED SPEED**

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 11.70  
Speed rpm : 1165...1175  
2nd rack travel in: 4.00  
Speed rpm : 1225...1235  
3rd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 5.2

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 550  
Rack travel in mm : 5.60...5.80

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1165...1175

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 550  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 6.00  
1000 s: (8.00)

Remarks:  
: C.D.C. # 3923480

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 5,6 a15  
 Edition : 23.10.92  
 Replaces : 02.92  
 Test oil : ISO-4113

Combination no. : 0 400 874 238R

Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 L  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 T

1st version kw : 90.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.20...12.30

Del. quantity cm<sup>3</sup>/ : 11.9...12.1  
 100 s: (11.7...12.3)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 415.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.1  
 100 s: (1.4...2.3)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 975  
 Del. quantity : 119.0...121.0  
 1000 : (117.0...123.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 90...98



Testing:  
1st rack travel in: 11.20  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
3rd rack travel in: 4.00  
Speed rpm : 1070...1090  
4th rack travel in: 1230  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 415  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 415  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 535...595

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 500  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 800  
Rack travel in m: 12.80...13.00  
4th speed rpm : 900  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 114.0...120.0  
1000 s: (111.5...122.5)  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 125.5...128.5  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1020...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 415  
Rack travel in mm : 6.60...6.80  
Del.quantity cm<sup>3</sup>/ : 17.0...21.0  
1000 s: (14.5...23.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KFD  
 Edition : 30.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 253  
 Injection pump  
 Pump designation : PES4A85D410/3RS2799-  
 2  
 EP type number : 0 410 884 941  
 Governor  
 Governor design. : RSV325...1150A8C2239  
 -6L  
 Governor no. : 0 420 232 582

Customer-spec. information  
 Customer : KHD

Engine : BF4L913

1st version kW : 70.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - \* : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1050  
 Rack travel in mm : 11.50...11.60  
 Del. quantity cm<sup>3</sup>/ : 7.9...8.0  
 100 s : (7.7...8.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.5...7.7  
 Del. quantity cm<sup>3</sup>/ : 1.2...1.8  
 100 s : (1.0...2.0)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.25

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1050  
 Del. quantity : 79.5...80.5  
 1000 : (77.5...82.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 97...105

Testing:  
 1st rack travel in: 10.50  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00

Speed rpm : 1120...1150  
3rd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1330  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 435...495

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 730  
Rack travel in m: 12.10...12.20  
3rd speed rpm : 885  
Rack travel in m: 11.70...11.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 730  
Del. quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (76.5...83.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 17.60...18.00

Remarks:

#### APPLICATION

Excavator

N20

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 12,0 h
Edition : 23.10.92
Replaces : 07.91
Test oil : ISO-4113
Combination no. : 0 401 838 709
Injection pump
Pump designation : PE8P110A120LS3271
EP type number : 0 411 818 723
Governor
Governor design. : RGV250...1100PA951-2
Governor no. : 0 421 813 908

Customer-spec. information
Customer : HAEP

Engine : WD815.66

1st version kW : 270.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 4- 8- 6- 3-
7- 2

Phasing : 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 4.1...4.3

Del.quantity cm3/ : 1.7...2.3

100 s: (1.5...2.5)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.30

2nd speed rpm : 485

travel mm : 3.20...3.80

3rd speed rpm : 640

travel mm : 4.20...4.80

4th speed rpm : 1145

travel mm : 8.40...8.60

5th speed rpm : 1220

travel mm : 9.80...10.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: ?

Testing:  
Speed rpm : 100  
Minimum rack travel: 4.60  
Speed rpm : 250  
Rack travel in mm : 4.10...4.30

CONSTANT REGULATION  
Speed rpm : 250...390

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 600  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 600  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 380  
Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 186.0...190.0  
1000 s: (183.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 117.0...119.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 220.0...260.0  
1000 s: (216.0...264.0)  
Rack travel in mm : 20.00...21.00

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD 19,2 a4  
 Edition : 09.06.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 766  
 Injection pump  
 Pump designation : PE12P110A920LS3173  
 EP type number : 0 411 810 708  
 Governor  
 Governor design. : RQV475...1075PA907-1  
 Governor no. : 0 421 813 739

Customer-spec. information  
 Customer : KHD

Engine : BF12L513C

1st version kW : 333.0  
 Rated speed : 2150

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

N23

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1075

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 13.4...13.6

100 s : (13.2...13.8)

Spread cm<sup>3</sup> : 0.5

100 s : (0.8)

2nd speed rpm : 475.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.7...2.3

100 s : (1.4...2.5)

Spread cm<sup>3</sup> : 0.7

100 s : (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 475  
 travel mm : 1.10...1.50

2nd speed rpm : 650  
 travel mm : 3.40...4.00

3rd speed rpm : 950  
 travel mm : 5.60...6.20

4th speed rpm : 1100  
 travel mm : 7.70...7.90

5th speed rpm : 1150  
 travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

Del. quantity : 134.0...136.0

1000 : (132.0...138.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (8.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 49...57

#### Testing:

1st rack travel in: 10.70  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 20...28

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 475  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 475...640

#### TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1075  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 800  
Rack travel in m: 12.30...12.50  
3rd speed rpm : 950  
Rack travel in m: 11.90...12.10

#### START CUT-OUT

Speed 1/min : 395 (415)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1095...1105

N24

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...165.0  
1000 s: (131.0...169.0)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN  
 Edition : 21.06.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 770  
 Injection pump  
 Pump designation : PE12P120A520/4LS3854  
 EP type number : 0 411 820 728  
 Governor  
 Governor design. : RQ750PA947-1  
 Governor no. : 0 421 801 587

Customer-spec. information  
 Customer : MAN

Engine : D2842LE 21

1st version kW : 443.0  
 Rated speed : 1500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30  
 : (4.15...4.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 13.00...13.10  
 Del.quantity cm3/ : 25.0...25.2  
 100 s: (24.7...25.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.4...4.6  
 Del.quantity cm3/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm3 : 1.0  
 100 s: (1.4)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Del.quantity : 250.0...252.0  
 1000 : (247.0...255.0)  
 Spread cm3 : 6.00  
 1000 : (10.00)

**RATED SPEED**

1st version  
 Testing:  
 1st rack travel in: 12.00  
 Speed rpm : 750...755  
 2nd rack travel in: 4.00  
 Speed rpm : 790...803  
 4th rack travel in: 950  
 Speed rpm : 0.00...1.00

Remarks: : MAN-NR. 2-7981



APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 12,2 a  
 Edition : 23.10.92  
 Replaces : 02.88  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 882  
 Injection pump  
 Pump designation : PE6P120A32ORS3206-1  
 EP type number : 0 411 826 775  
 Governor  
 Governor design. : RQ750PA783-1  
 Governor no. : 0 421 801 432

Customer-spec. information  
 Customer : VOLVO-PENTA

Engine : TAMD 122 A

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 931 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

N27

Firing order : 1- 5- 3- 6- 2- 4  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.70...12.80  
 Del. quantity cm<sup>3</sup>/ : 30.9...31.1  
 100 s: (30.6...31.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.1  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.8)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 309.0...311.0  
 1000 : (306.0...314.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Testing:  
 1st rack travel in: 11.70  
 Speed rpm : 747...752  
 2nd rack travel in: 4.00  
 Speed rpm : 774...789  
 4th rack travel in: 850  
 Speed rpm : 0.00...1.00

BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 11.70  
 Speed rpm : 747...752

Remarks:

:

APPLICATION

Generator set

